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The Transport Bill

THE terms of the Transport Bill, introduced in the House of Commons by Mr. Alan Lennox-Boyd, Minister of Transport, and read for the first time on Tuesday, and published as we go to press, are indefinite as to the reorganisation of the railways. This was expected, as the Government had expressed its intention of leaving details to be submitted by the British Transport Commission in a scheme, now required within twelve months from the passing of the Act, or longer, if the Minister of Transport allows. The new Bill, however, requires the Commission's scheme to provide for the abolition of the Railway Executive, with the qualifying phrase "if it has not already been abolished"—which seems to postulate far-reaching Governmental action cutting across the procedure hitherto expected. The setting up of area railway managements, with, presumably, greater autonomy than is enjoyed by the existing Regions, with a railway authority for the whole of Scotland, was predicted in the White Paper on transport. The Commission is to continue to exercise a general authority over the railways in matters of finance, charges, and general policy, but its maximum membership is to be enlarged by two, and in stating the qualification for membership the Bill tends to emphasise the requirements of transport users, and specifically includes agriculture where the Transport Act, 1947, required general industrial and commercial experience. A welcome clause empowers the Commission to cover increased costs by raising charges by up to 10 per cent. without prior sanction of the Transport Tribunal. One effect of the Bill might be a possible increase in amounts payable for Services passenger traffic as a result of amending the Cheap Trains Act of 1883, for which provision is made. The Road Passenger Executive is to be dissolved and the provisions of the Transport Act, 1947, as to road passenger area schemes, are repealed, but no decision appears to have been made as to the future of the Hotels Executive. The most specific part of the new Bill is that dealing with the disposal of nationalised road transport. Provision is made for the incorporation of companies under the control of the Commission for road haulage activities.

Better Fuel Outlook

COAL output above the pre-war average and higher exports than at present were forecast by Mr. Geoffrey Lloyd, Minister of Fuel & Power, on Monday in a review that covered many aspects of the utilisation and distribution of coal, oil, and electricity. The announcement on the following day that a 10 per cent. cut in peak hour electricity consumption will again be necessary from November 1 next to January 31, 1953, lends added interest to his statement that a joint committee of the British Electricity Authority and Electricité de France has reported that a submarine cable linking the generating capacity of the two undertakings is technically practicable. Such a scheme, although necessarily for some future date, would enable this country to draw upon part of the hydro-electric power of the stations in the Alps. Another project, for a high-capacity grid system to distribute electric power from new B.E.A. generating stations in the Midlands coalfields, is calculated to be able ultimately to save the transport of 4,500,000 tons of coal a year to London. With the likelihood of its becoming cheaper to transmit electricity over long distances than solid fuel, the traffic flows of the future may show a marked change from their present pattern, and impetus will be given to reducing the costs of fixed installations for electric traction.

British Transport Commission Statistics

CONTINUED improvement in the recruitment in certain grades of British Railways staff in which there have been serious shortages is shown in the statistics for Period 5, the four weeks to May 18. In guards, signalmen, porters and so on, wastage of 1,444 was offset by 2,203 recruits. The footplate and cleaners group received 1,121 recruits —presumably cleaners—against wastage of 779, which with the previous improvement seems to have had visible effects in the cleaner locomotives now turned out by some sheds. Docks did well, with receipts some 20 per cent. up on last year. Total tonnage in and out during Period 5 was 5,572,000, against 4,769,000 in 1951, with a marked rise outwards, from 2,724,000 to 3,440,000 tons. The most significant improvement perhaps was in coal shipped from Humber Ports, 687,000 tons compared with 292,000 tons last year; the comparable tonnages for South Wales and North Eastern ports are 668,000 and 555,000, and 849,000 and 781,000 respectively.

Visitors to Britain

INTERNAL transport services earned £15 million of the £103 million, brought to Britain by overseas visitors in 1951. Earnings were £15½ million higher than in the previous year, and 14 per cent. more visitors came than in 1950. The annual report of the British Travel & Holidays Association for the year ended March, 1952, appeals to all members of the British public to take a greater and more discerning interest in its transport facilities, among other services, because a nation gets no better amenities for tourists than it demands for itself. Last year saw the introduction of new rolling stock on certain services carrying tourist traffic, a measure inspired by the Festival of Britain and one that doubtless helped to send visitors home

with a good impression of British Railways. Reactions in the current holiday period to reductions in restaurant car facilities, increased prices of meals, and lack of distinction in some timetables between buffet and full meal service, would be an interesting study. More may sometimes be learned from the visitor than from a public at home that may be influenced by partisan criticism or by a too ready acceptance of reduced amenities after the years of austerity.

Overseas Railway Traffics

NET earnings of the Canadian Pacific Railway rose by £239,000 to £586,000 during May, as a result of a £581,000 improvement in gross earnings. There was a further increase in working expenses for the month, though on a smaller scale than the advance in gross earnings. Working expenses were £342,000 higher at £12,457,000 and gross earnings amounted to £13,042,000. Aggregate C.P.R. gross earnings since January 1 are now better by £4,122,000 at £60,769,000, but net earnings at £2,848,000, compare with £3,249,000 for the equivalent period of 1951. On the Canadian National Railways during May the advance in operating expenses exceeded that in operating revenues and there was a resultant decline by £155,000 in net revenue. Operating revenues rose by £1,793,000 to £19,453,000 and expenses by £1,954,000; net revenue amounted to £1,554,000. Aggegate net revenue for the current 22 weeks amounts to £3,963,000, as compared with £4,905,000 for last year.

Indian Railway Development

MR. F. C. BADHWAR, Chairman of the Indian Railway Board, addressing a press conference recently, said that of some £60,000,000 provided for in the Railway Budget for development, only about £5,000,000 to £6,000,000 could be really called development expenditure. The rest of the expenditure was essentially rehabilitation. For various reasons they had not been able to keep pace with renewals and replacements for the past 12 years, but they were being given a chance to overtake those arrears and would try to replace as many locomotives and wagons as they should have on paper. In January, 1951, he pointed out, the railways had had fewer wagons than in January, 1950, but they carried more goods in that month despite the shortage. The speed of trains had to be restricted because rails could not be renewed, but he hoped that by the end of the next ten years the permanent way would be restored to a condition where trains could run faster. Mr. Badhwar denied that a large part of the development expenditure would be spent in foreign countries He said for the last three or four years Indian industry had been developed to produce certain essential parts for the railways, and 80 per cent. of the requirements would be obtained in India.

London's Tramways Abandoned

IN the early hours of Sunday last, July 6, the final section of the London tramway system was abandoned, when Lord Latham, Chairman of the London Transport Executive, received the last tram to run into New Cross Depot. From the first (experimental) lines in 1861-2, the route mileage grew to about 350 at its peak; London Transport inherited 327 miles on its formation in 1933. The first permanent lines were opened in May, 1870, so London has had a continuous tramway history of 82 years. Steam locomotive traction was used for six years (1885-1891) on lines in the outer Northern suburbs around Tottenham and Edmonton, and cable operation on Highgate and Brixton Hills; the former, opened in 1884, was the first in Europe. For shorter periods compressed air, batteries, oil vapour motors, and gas engines were tried as motive power, but animal traction was the mainstay until the familiar electric traction from a central power station was introduced to the public streets of the Metropolis in 1901. By introducing cheap fares, early and late cars (and subsequently all-night services), return tickets, covered-top cars, and so forth, the tram far more than the bus became a competitor of the suburban railway. It was mainly responsible for the decision after the first war to close most suburban stations on non-electrified railways within a five-mile circle. Tramways in their day made no mean contribution to passenger transport in London; their final passing is described elsewhere in this issue.

Traction Power Supplies, Southern Region

BY 1954 it is hoped that the first stage will have been reached in substituting 50-cycle power supplies from the Grid for the 25-cycle supply at present generated for the Southern Region London suburban system at Durnsford Road and Deptford. These two power stations were put in service before the development of the mercury-arc rectifier, and served substations in which rotary converters provided the d.c. for traction. At that time there were difficulties in designing rotary converters for a 50-cycle input. When the generating plant at Durnsford Road and Deptford became due for renewal, the opportunity arose to dispense with the 25-cycle system, and a scheme for deriving and distributing power from the Grid was authorised by the Railway Executive in 1950. The plant at Durnsford Road will not be replaced, while Deptford (now owned by the British Electricity Authority) will be rebuilt for 50-cycle generation. Realisation of the whole project will see the end of the 46 continuously-manned rotary converter substations still operating. Contracts for rectifiers, switchgear, and the distribution system for 72 remotely-controlled substations have totalled about £12 million. As recorded elsewhere this week, the increased capacity of the new installations will permit of longer trains and improved acceleration.

Shunting Controllers for Tube Stock

AUTOMATIC acceleration of electric stock offers possibilities of modifying the design of master controllers, and moving away from the forms evolved for convenience in notching up by hand. An example of the simplicity and compactness that may be achieved is seen in new equipments now being fitted in London Transport tube cars to enable ordinary passenger entrances at the ends of units to be used as driving positions when working to and from depots. The apparatus, illustrated on another page, is housed in an end panel similarly to the guard's door controls. Instead of a controller handle combining the functions of applying power to the motors and setting the running notch required, a selector handle is turned to " shunt " or " series " and the train is started by pressure on a push-button. Two notches are sufficient for the light running of short units and the shunting movements for which the controls have been provided. The arrangement enables short sections not required in off-peak hours to be handled without sacrificing passenger entrances available in busy periods, and avoids delays in loading that may occur when two driving compartments are adjacent in a rush-hour train.

High-Speed B-B Locomotives for French Railways

ALTHOUGH a class of 2-Do-2 locomotives embodying numerous technical refinements is handling the principal expresses on the Paris-Lyons main line, the French National Railways have announced their intention of building power bogie types in future. A series of Co-Co machines was ordered after the Alsthom prototype had showed its capabilities, but the administration is aiming ultimately at a lighter locomotive in the interests of lower costs and reduced energy consumption. Two high-speed prototypes with the B-B wheel arrangement, weighing 80 *tonnes* against the 102 *tonnes* of the Co-Co, are now being built. Details given by M. Jacquemin, Head of Electric Traction Development, S.N.C.F., in the *Revue Générale des Chemins de fer*, show several novelties in the bogies and transmission system. A swing link arrangement instead of a pivot will transmit the tractive forces to the body, which will rest on bearers supported by leaf springs suspended from the bolster. Side members housing the axleboxes are suspended from the bogie frame by coil springs. Both motors in a bogie will be coupled

through a common gearwheel, and each will drive through an intermediate gear to a final gearwheel linked with the driving wheel at the opposite side of the bogie by universal joints and a hollow cardan shaft surrounding the axle.

Fastenings for Flat-Bottom Track

FLAT-BOTTOM track, secured to the sleepers by dog spikes, has been in general use since the early days of railways. This type of fastening offers the advantages of rapid and cheap construction, and economy in maintenance costs, especially in countries where plentiful supplies of timber allow of the load being spread on closely-spaced sleepers. In comparatively recent years, however, increasing use has been made of cast-iron or steel baseplates to distribute the load over the sleepers, and of alternative types of fastening. Less than four years have elapsed since flat-bottom track was adopted as the standard for British Railways, and tests are still in progress to ascertain the baseplates and fastenings most suited to varying conditions. The principal types now in use, or on trial, are reviewed in an article, the first part of which appears elsewhere in this issue. A considerable time must elapse before the merits of each design can be fully assessed. Some of the questions involved belong more to the realm of economics than that of engineering design, and until conditions become more stable, it may be impossible to give complete answers.

Design of Valve Pins on Locomotives

THE design of valve gear pins to ensure a pin of adequate strength to carry the loads necessary, is discussed in an illustrated article elsewhere in this issue. The designer is also concerned with the subject of wear and maintenance in service and the provision of adequate means of lubrication to various pins, especially those in positions most subject to the deposit of dirt, such as brake rigging and spring gear. This is largely catered for in modern designs of locomotives by the provision of grease nipples, which materially assist in ease of maintenance, as grease functions as a film longer than oil and also cushions the load better. Such a provision also avoids the constant use of an oilcan, with which it is often difficult to reach some parts, so that they may not receive adequate attention. Maintenance costs on brake rigging and so on have in recent years been considerably reduced by the provision of easily replaceable bushes, while increasing preference is also being shown for the use of needle roller-bearings.

Locomotive Footplates

WHATEVER the many and various views of the footplate arrangements on British standard locomotives, half an hour in York Railway Museum will dispel any idea that outstanding progress has not been made in this aspect of locomotive practice. Despite being aided by the small number of simple fittings and small boiler back compared with present-day needs, most of the layouts produced by the supposedly practical 19th Century engineers seem to have been shockingly unpractical. So eminent an engineer as "Daddy" Fletcher required his enginemen to step back a good pace from the regulator if they wanted to operate the reversing lever; and, with an almost open cab, gave his firemen a corridor to walk down with their laden shovels, putting a brake screw handle conveniently where it could stick in their midriffs. Worsdell's No. 1621, with a hot-air-pocket cab, retained the fireman's corridor. Only *Gladstone* of all the engines on view has the semblance of a shovelling plate or sloping coal bunker. *City of Truro's* coal could come forward only by hard manual labour for each shovelful; and on most engines—again with the exception of *Gladstone*—the fireman had a good walk from the tender to the tiny firehole. The "practical" side is seen in the cramped footplate of *Aerolite*, where there is a foot-pad on the reversing sector to give the driver extra purchase in pulling over his tiny reversing lever. Patrick Stirling was equally solicitous; he, or someone else, attached a wooden seat to No. 1's sector plate.

Operating Results in May

THE first four issues of the 1952 series of *Transport Statistics* revealed a distinct improvement in the operating results of British Railways. No. 5, covering the four-week period to May 18, proves that they have recovered completely the mobility which they lost towards the close of 1950. Springtime is always a good season for freight train working, and this year several of the most significant averages are records for the nationalised system. Freight train speed slightly exceeded 9 miles an hour, a figure never attained in any previous period. The unit output of freight train operation also reached a peak at 1,187 net ton-miles per train engine-hour. The third measure of movement, wagon-miles per train engine-hour, rose month by month from 215 in January to 238 in May—another record which was last approached in May, 1950. A cut of 4·7 per cent. in steam coaching train-miles would make freight movement easier, though both steam and electric trains were scheduled to run faster than in the spring of recent years. This process of enlivening all services should help to restore the prestige of our railways, if it is maintained throughout the summer months.

There was nothing exceptional about the volume of traffic in May. While tonnage was 4 per cent. and ton-mileage 1·9 per cent. above the corresponding lean period of 1951, neither figure was an increase on 1950. The tendency for merchandise forwardings to decline was again noticeable. The tonnage of 4,052,000 was the lowest in any May period, being 8·8 per cent. below the carryings of 4,444,000 tons in May, 1949. The Eastern Region was singular in having a large increase in merchandise as well as in other classes of traffic. The table below compares its operating effort with the results of the North Eastern Region and with the all-line performance.

OPERATING RESULTS, 4 WEEKS TO MAY 18

Statistic	Eastern Region	North Eastern Region	All Regions
Percentage increase in—			
(*a*) Tonnage	9·2	3·8	4·0
(*b*) Net ton-miles	7·1	5·1	1·9
(*c*) Freight train miles	6·4	4·7	3·3
(*d*) Freight train hours	0·6 (decrease)	1·3 (decrease)	2·9 (decrease)
Train load (tons)	170	157	159
Freight train speed (m.p.h.)	9·29	11·35	9·05
Net ton-miles per train hour	1,327	1,548	1,187
Wagon miles per train hour	261	289	238

The table shows that freight train-hours were lower all round, but last year, owing to congestion on some sections of line, a good deal of motive power was unable to perform the usual amount of effective work. The last three statistical items are the really satisfactory feature of the table, for they indicate a general speeding up of freight movement.

The North Eastern Region is setting the pace. Its trains were not loaded heavily. That may be one reason why they exceeded the average speed recorded by any Region in any period. When the loading and speed factors are combined to find the output of freight train operation, as measured by net ton-miles produced in a train-hour, the North Eastern Region again leads the field. Its record output in May was 30 per cent. above the all-line average and 16 per cent. over the Eastern Region figure.

On the passenger side, there are details of carryings for the month of April. As the month included the Easter holidays, the figures are rather disappointing. Passenger journeys numbered 86,837,000, an increase of 1,558,000 on 1951 (1·8 per cent.). About 59 per cent. of these extra journeys were made at excursion and other low fares. First class bookings decreased by 251,000 (11·2 per cent.) and receipts by £32,000 (3·3 per cent.). The ratio of first class receipts to total passenger receipts dropped from 12·5 per cent. in April, 1951, to 9·6 per cent. The decline affected all Regions, but was most serious in the London Midland, Eastern, and North Eastern.

London Transport in 1951

LORD LATHAM, Chairman of the London Transport Executive, has issued his fourth annual letter to the staff, in which he faces up in his opening paragraphs to the "most unsatisfactory and disappointing" financial results for 1951. It is unfortunate that the Executive has no more agreeable reminder in its accounts of the Festival Year, to which its services and staff contributed so much. Londoners, however, are still benefiting from some of the improvements and renovations of premises completed for the Festival. Nearly 4½ million passengers were carried on special Festival services, this figure being additional to the numbers of visitors using the regular facilities. General service improvements during the year were concerned mostly with road transport, for present economic conditions forbid the tube railway extensions the Executive would like to undertake. Various measures have been taken, however, such as the spreading to the Central and Northern lines of the practice of running shorter trains at appropriate times of day so as to achieve operating economies by the reduction of car-miles.

The Executive's receipts and expenditure for 1951 were embodied in the statement of results issued by the British Transport Commission last month (see our June 20 issue). Lord Latham's letter traces the sharp rise in cost of materials during the year and the substantial increases in wages and salaries. As a result, although traffic receipts were £3,560,000 higher, working expenses went up by £6,860,000, a difference on the wrong side of £3,300,000. Receipts from fares were £1,550,000 less than working expenses, and the addition of £1,800,000 received from other sources gave a net operating surplus of only £250,000 on a total income of £60 millions. A diagram reproduced with Lord Latham's letter puts the situation in graphic form by showing that from each pound received, only one penny is contributed towards the operating surplus. Wages, salaries, National Insurance, and other staff costs take 155d. in the pound.

Application for a substantial increase in fares was made in April, 1951, when it became apparent that rising costs were seriously outrunning traffic receipts. The worsening trend in succeeding months made it necessary for this application to be increased. Hearings before the Transport Tribunal began in October last, but the authorisation to raise charges did not become effective until March this year, and the permitted increases were estimated to produce £2 million less than had been asked for. A week later the Budget, by increasing the duty on fuel, added £1,150,000 a year to the Executive's expenses. Lord Latham emphasises that he does not complain at public and independent scrutiny of proposals to alter fares, which are made with full realisation of their effect on the personal budgets of daily travellers, but it is the delays of the present procedure that have serious consequences, in this instance compelling the Executive to operate for nearly a year on the basis of one level of prices for what it bought and another for the service it sold.

Present London fares, Lord Latham says, compare very favourably with the increase in price of almost every other service and commodity. He emphasises that the total general increase was 74 per cent. above pre-war, while the Executive's own costs were up by 120 per cent. Dealing further with the question of costs and receipts, Lord Latham says: "In particular, we must see to it that all fares are collected. People must not get a ride for nothing or for less than the proper fare. We really cannot afford the injustice of allowing some passengers to travel free while others have to bear the burden which avoidance of payment by a few imposes on the rest of the community."

Since nationalisation the public is made more aware by newspaper comment of the economic affairs of transport than it was in the past, and is naturally anxious to know whether anything can be done except putting up fares. Lord Latham reviews the search for improved efficiency constantly pursued by the scientific and engineering branches, and gives the reminder that efficient equipment does not run itself but that a good day's work, well done, at all levels is the essential basis of better results. He calls for the maintenance of a high standard of civility and service to passengers as a means of encouraging them to use the Executive's facilities to the fullest extent. Lord Latham's letter concludes with a picture of the London Transport area of future years, with New Towns of 40,000 to 80,000 people beyond the Green Belt. Ideally the bulk of these populations would work locally, but there is the probability that large numbers will travel to and from London daily.

Nigerian Railway

THE report of the Nigerian Railway for the year ended March 31, 1951, which has been received from Mr. D. C. Woodward, General Manager, points out that in 1951 the railway celebrated the fiftieth anniversary of the opening of the Lagos-Ibadan section of the then Lagos Government Railway, the first constituent of the present system. The financial year 1950-51 saw no improvement on the preceding year; of the deficit of £327,214, expenditure of some £250,000 was incurred by introduction of temporary additions of pay to all Government employees. Increased revenue was overtaken by rising costs, including that of coal, and rates and fares were kept down until a point was reached when this policy was no longer practicable. Greater revenue had been expected from increased traffic, but the poor groundnut crop of 1949-50 and an appreciable deficit in coal output from Enugu were adverse factors. Operating difficulties arose from inability to maintain locomotives in service pending the delivery of new ones.

The following are some of the principal results during 1949-50 and 1950-51:—

	1949-50	1950-51
		(thousands)
Passenger journeys	5,552	5,585
Tonnage hauled	1,299	1,225
Passenger train-miles	1,080	1,275
Goods train-miles	4,330	3,981
		(£ thousands)
Passenger, parcels and mails receipts	1,015	1,115
Goods and livestock receipts	4,911	5,027
Road transport receipts	47	64
Total operating receipts	6,145	6,404
Operating expenditure	4,159	4,883
Operating surplus	1,986	1,521
Renewals contributions	830	830
Interest on capital	901	754
Net deficit	— 283	— 327

Operating receipts at £6,404,000 were almost £260,000 greater than in the preceding year, the figures for which were in themselves a record. Income from all sources was greater. Expenditure, on the other hand, rose by £725,000 as compared with 1949-50. Considerable economies were effected, mainly by restriction of works on net revenue account, by the curtailing of recruitment, and by an economy drive to reduce stores consumption. The rate on groundnuts was raised, and a 10 per cent. surcharge on passenger fares introduced in September, 1950. Net operating earnings nevertheless were reduced to a little over £1,000,000, quite insufficient to meet interest charges, the additional contribution to the renewals fund and other items of net revenue expenditure. The report remarks that the share of the gross revenue retained by the railway from its efforts during the year was reduced to only 12 per cent.—less than the depreciation in works and equipment during that period. "Recurrent results of this nature," it is stated, "can only lead to irretrievable disaster and drastic action must be taken to improve the situation." Although decreases were expected in other traffics, passenger-journeys increased slightly, with increases of 12 per cent. in the average length of journey and of 10 per cent. in passenger receipts, for which last the surcharge on fares and further measures against ticketless travel were largely responsible. A regular parcels service by Limited trains was introduced.

It was decided, largely in accordance with the recommendations of Mr. H. F. Pallant, of British Railways, North Eastern Region, who in 1949 was asked to examine Nigerian Railway operating problems, to form, from April 1, 1951, an Operating & Commercial Department

under a Chief Superintendent, combining the Running Section of the Mechanical Department with the Traffic and Commercial side of the former Traffic Manager's Department. Mr. Pallant's recommendation that a Commercial Department should be formed was not followed, on account of local factors. The new organisation was the subject of an editorial article in our issue of November 16, 1951.

Whilst it was possible slightly to improve on the previous year's engine failures the position, at 9,908 miles per failure, is stated to be far below what it should be. This, and the fact that workshops' output showed little sign of improvement, made it necessary to study all possible means of increasing locomotive availability and supply of spare parts, the shortage of which continued. A production engineer was engaged to examine closely workshop methods and organisation: at the same time representations were made to the railway union concerned on increased effort on the part of workshops and running shed staff. A response to this appeal was recorded. During the year sixteen new locomotives were received and placed in service, which made the fleet of " River " class locomotives 63 in all. In addition, there were the 24 " Newfoundland " class locomotives of similar capacity, all of which continued to give good service. The report refers to the placing in service during the year of new third class coaches and the expected delivery of staff coaches built by Cravens Railway Carriage & Wagon Co. Ltd. Some 76 covered goods wagons, 57 cattle wagons and 81 open goods wagons were put into service.

For the first time since 1943-44, the road transport section produced a surplus, compared with a deficit of £12,900 in 1949-50. To a large extent improved working was due to the scrapping of vehicles and replacement by Leyland " Comet " four-ton lorries. Port capacity at Apapa and Port Harcourt was taxed to the utmost. Work was begun on the Apapa Wharf extension. The need for economy necessitated restriction of capital works to those in hand or essential for movement of additional traffic; these included the new running shed at Ebute Metta, new station offices and passenger facilities at Ibadan, and new passenger and goods stations and enlargement of marshalling yard at Jos. Much remained before work could begin on the Lagos terminal. It was decided to abandon the Bornu Province extension project.

Floods and Sudds

A GOOD example of the manner in which the railway civil engineer has to combat freaks of nature peculiar to particular countries is provided by an article in the first issue (May, 1952) of *Rhodesia Railways Magazine*. Abnormal rainfall caused the flood level of the Kafue River on March 23 to exceed the previous highest known level of May, 1948, by 2 ft. 5 in., and rise to within 11 in. of the underside of the main girders of the Rhodesia Railways' Kafue Bridge, a fine structure consisting of 13 through truss spans each of 100 ft. The raising of the level of the bridge by five feet in 1926, and the raising of the southern approach by three feet after the 1948 flood, were thus abundantly justified, for the water this year rose to within a few feet of the rails.

The safety of the bridge was endangered not so much by the water as by the quantity of sudd (floating vegetable matter) brought down. This collected to form floating islands bearing down on the bridge and threatening to jam against the girders, obstruct the current, and exert great lateral pressure on them and on the piers. This danger was met by a number of measures, including the fitting of special deflectors to the bottom chords of the spans, designed to force the sudd downwards and under them. Floodlighting was also installed to enable the work of cutting away the sudd from the piers to continue night and day. Further precautions were taken, with the co-operation of the Southern Rhodesia Air Force, to ascertain the volume of sudd approaching the bridge, by making daily reconnaissances of the river. The gangs working on the bridge and its approaches could thus be warned, and the Air Force was also able to warn by radio telephone the special motorboats collected for dealing with the sudd. These measures proved adequate to deal with the situation, and after an anxious and strenuous time, the staff succeeded in passing all the islands under the bridge, thus averting the threatened danger until such time as the flood began to fall.

Timber Preservation in America

IN the United States and Canada the wood preservation industry is highly developed and is still expanding. For this reason the impressions formed by Mr. H. A. Richardson, Officer in Charge of the British Forest Products Research Laboratory, Department of Scientific & Industrial Research, during an extensive tour, are of considerable value. We have received a copy of his report from the United Kingdom Mission of E.C.A. Mr. Richardson states in his report that in general the American treating plants are more modern and better equipped than those in the United Kingdom and that they are frequently designed by specialists in this field. Each is generally adapted to the treatment of a particular class of material and much attention is paid to plant control. A well-equipped laboratory is considered as an essential part of the plants which are under highly-skilled technical staff.

Much of the report is necessarily devoted to general descriptions of American timbers and their treatment, but there is also ample information concerning the preservation of sleepers and other materials used by railways. Briefly, it may be noted that more than 94 per cent. of all timber treated in the United States is impregnated with creosote or creosote mixtures, and preliminary seasoning is now frequently achieved by the quick vapour-drying method. The preservative used for sleepers is generally a mixture of creosote with either coal tar or petroleum oil. A load of sleepers can be vapour-dried from the green condition and impregnated with a creosote mixture within 24 hr. with less splitting than would occur with air seasoning. For instance, with oak sleepers, which are widely laid in the U.S.A., the moisture content can be reduced from 75 per cent. to 40 per cent. by this vapour process—a reduction that would take 12 to 15 months of air seasoning—and a number seen by Mr. Richardson after seven years in the track appeared to be in better condition than the corresponding air-seasoned control sleepers nearby. Eleven U.S.A. railways now have lengths of vapour-dried sleepers in the track experimentally, and two administrations have converted their treating plants to include this process. We are reminded, however, that vapour-drying was developed to deal with timbers which were difficult to air season satisfactorily; it does not offer the same advantages where air-drying can be carried out successfully without deterioration in the timber.

Pine timber has also been experimentally vapour-dried before treatment with water-borne preservatives, such as Boliden, Celcure, and greensalt, after which it is re-dried, the whole process being completed within 24 hr. and without the removal of the timber from the pressure-cylinder. Pine has also been similarly treated with Cuprinol, as such expensive solvents can easily be recovered from the plant, but in practice all American railways use creosote mixtures, and most treatments are by the Lowry or Rueping empty-cell methods of impregnation. Mr. Richardson found that water-borne preservatives for sleepers were widely condemned as inferior to oil preservatives. As effectively combating splitting and other mechanical defects, a creosote-coal tar mixture is the most favoured sleeper preservative at the present time. It also has the advantage of being cheaper than creosote alone. The coating of exposed surfaces of sleepers in the track with bituminous or coal tar preparations is found to be very effective in preventing hard-wood sleepers from splitting.

Another treatment being tried to prevent red oak sleepers from splitting, and at the same time season them rapidly, is to heat them in a bath of creosote containing from 5 to 10 per cent. Glycol or similar compounds for about 6 hr. at atmospheric pressure. There are high hopes for

this treatment, which is reported to reduce the moisture content from 80 to 35 or 40 per cent.; it is followed by the usual creosoting processes. Other measures to reduce splitting have also undergone extensive trials, but the only one that appears to be really promising is with a viscous coal tar preparation manufactured by the Koppers Company.

As in other countries, another serious defect in sleepers in America is caused by soleplate cutting. Mr. Richardson was shown specimens in which over 1 in. of cutting had occurred in less than ten years in the track. Rust forming under the plates appears to affect the physical properties of the wood and induce a breakdown of the fibres, a condition already noted in this country.

On the subject of piling and the depredations of marine borers, Mr. Richardson reminds us that in the U.S.A. only round piles are used, because they retain the natural sapwood, which can be completely impregnated with creosote or creosote-coal tar solutions as a protection against the borers. He also includes some notes on laboratory tests of the fire-resisting properties of various timbers and wallboards, in special panels and in the form of doors, floors, and other structural parts. The bulk of the report is devoted to features of the plants visited.

Turkish State Railways

TWENTY-FIVE years of service were achieved on June 1, 1952, by the Turkish State Railways administration as constituted in 1927 by the government of the young republic. Government control of railways within the present frontiers of Turkey was inaugurated simultaneously with the new republican *régime*, proclaimed on October 23, 1923. At that time, various isolated lines were scattered over the whole of the country, divided by the Bosphorus between the European and Asiatic territories of the republic. These tended to serve the more fertile regions, whilst the north, centre, and east of Turkey were badly served by both rail and road. Because of the urgent need for adequate land communications, the Government of Turkey since 1923 has given high priority to railway development.

The Turkish State Railways today include standard-gauge lines: (*a*) *purchased*: Anatolia—Baghdad, with branches (1,300 miles), Smyrna—Aidin (380), Smyrna—Cassaba and Extensions (450), Istanbul—Adrianople (215); and (*b*) *built by the Turkish Government*: Ankara—Erzerum (720), Zonguldak—Irmak (260), Samsun—Kalin (240), Fevzipasa—Cetinkaya (260), Malatya—Kurtalan (255), and Kutahya—Balikesir and branches (260 miles). There are also various narrow-gauge lines, largely in the north-east of the country. The total mileage is 4,722, of which 4,540 is standard gauge.

The construction of the many new and purchase of existing lines necessitated creation of an administration responsible for the technical and financial control of the system which should also foster economic development through its tariff policy and through unification and standardisation of practice on the several lines. The result was the establishment on June 1, 1927, of the General Management of the Turkish State Railways, which are considered today by the Government of the republic as the chief source of national prosperity. The railways serve a far-flung territory well endowed with natural resources, and with a wide variety of climate. Distances by railway include Adrianople (western) to Arpaçayi (eastern frontier), 1,510 miles, and Smyrna to Erzerum, 1,170 miles; these compare with maximum distances of 850 miles in Germany, and 860 in France. The system, though small in relation to the area of the country, is of great importance in internal and international transport. It links the frontiers of the country, conveys the produce of the east and south to the consuming regions in the centre and west, and unites the continents of Europe and Asia, *via* the ferries over the Bosphorus.

There are at present 885 steam locomotives, 1,177 passenger vehicles, 14,532 goods wagons, 1,242 special type wagons, and 16 diesel train sets. In 1951, the workshops repaired or overhauled 819 locomotives, 1,292 carriages, and 11,477 wagons. Some 876 wagons were fitted with continuous brakes and 100 mineral wagons, imported from abroad, were assembled.

The Turkish State Railways work an auxiliary road service over some 400 miles, the "Iran Transit Route" from Trebizond to the Iranian frontier. They also work, as a monopoly, the fully equipped ports of Haydarpasa, on the Asiatic shore of the Bosphorus, Derince, on the Sea of Marmora, Mersin and Iskenderun (Alexandretta), both on the Mediterranean, and Samsun, on the Black Sea. The number of employees was 45,000 at the end of 1951; some reduction in numbers is being effected through rationalisation and mechanisation. A far-reaching programme of staff welfare is being executed. Legislation is under consideration by the Government, which is designed to give the State Railways greater independence, with a less rigid structure more in accordance with economic requirements, and the character of a purely economic public utility.

Recent measures taken by the General Management include abolition of certain Districts, reorganisation of some all-line departments, and adoption of a locomotive water filtering system which will result in considerable coal economies. A public relations service has been inaugurated. Regional economic bureaux will shortly begin to function for the study of local economic and commercial activity and developments. Electrification is to commence with that of the suburban lines serving Istanbul on both shores of the Bosphorus. The number of railcars is to be augmented for local services. Diesel trains of the latest design are being, and will continue to be, placed in service for fast services between Ankara and provincial centres; a number of these sets has been built by Maschinenfabrik Augsburg-Nürnberg A.G.

There has been a great increase in long-distance passenger services with sleeping and restaurant car facilities provided by the Compagnie Internationale des Wagons-Lits; these include, besides the "Taurus Express" (Haydarpasa—Ankara—Aleppo—Baghdad), the "Ege Express" (Ankara—Smyrna), "Guney Express" (Haydarpasa—Kurtalan, near the Iraq frontier), and others. The connection with Central and Western Europe by the "Simplon Orient Express" has been broken, at least temporarily, by limitation of the Paris-Istanbul sleeping car to west of the Bulgarian frontier.

Letters to the Editor

(*The Editor is not responsible for opinions of correspondents*)

Branch Line Services

June 26

SIR,—The main reason for the closing to passenger traffic of the Bulford branch, mentioned in Mr. Latham's letter in your issue of June 20, seems to be the temporary decline of Bulford as a military centre. At present there are comparatively few troops in the garrison, so that it has not been felt necessary of late to run the special troop trains for which the branch was noted. Contrary to Mr. Latham's opinion, the station at Amesbury is at a decided disadvantage; it is at the extreme end of this rather long, straggling town, which is connected with both Salisbury and Andover by a 20-minute bus service. At Bulford also, the station is apart from Bulford village and over a mile from the garrison. It seems strange that the publicly advertised trains never continued their journey to Bulford Camp Station where much revenue could have been obtained from servicemen travelling on leave. The same applies at Boscombe Aerodrome, where a good opportunity has been lost in the past by not providing a halt adjoining. It is a great pity that the Southern did not have a little more of the Great Western halt complex, which has done much to keep some former G.W.R. branches open.

Yours faithfully,

J. F. BURRELL

80, Longmead Avenue, Bristol, 7

THE SCRAP HEAP

No Drinks in Delaware

Lord Goddard, during the hearing of a case on serving drinks in Thames steamers, recalled a train journey on a Sunday to Virginia. "Suddenly," he said, "the glasses were swept off the table, and I protested that I had not finished. The staff replied: 'You are in the State of Delaware.' We were allowed to have nothing on the train in the State of Delaware. Fortunately it was a very small State."

Nurseries in Trains

Might we not adopt a Scandinavian practice—a few compartments (or in Pullman trains a coach) to be marked "Children"? Children would be prohibited from going into other compartments, but anyone with or without children might travel in these unless they were full. The slight bother to the mother at the beginning of the journey of finding one of these compartments would be offset by the elimination of one of her worries—that her children are disturbing fellow-passengers.—*From a letter to "The Manchester Guardian."*

To Brighton by Pullman Car

Inaugural runs of new trains attracted equally interesting gatherings of railway personalities sixty years ago as these and similar functions do today. The photograph reproduced below came to light recently at the premises of the Monarch Controller Co. Ltd., and we are able to reproduce it by courtesy of Mr. G. Pettigrew-Smith. In this group at Brighton Station after a trial trip of the new Pullman train on December 10, 1888, several directors and officers of the London Brighton & South Coast Railway are to be seen; the original bears their autographs. William Stroudley, Locomotive Superintendent, is ninth from the left. Next but one to him, counting towards the right, is A. Sarle, Secretary & General Manager, and three places further on (to right of coach doorway) is R. Jacomb Hood, Engineer of the Brighton Company from 1843 to 1860, and later a Director. On his left stands Ralph L. Lopez, Deputy Assistant Chairman. The Goods Manager of the Brighton, G. W. Stainforth, is fourth from the right of the group.

The occasion was the first run of a regular all-Pullman service to Brighton. There had been Pullman cars on Brighton trains since 1875, and an all-Pullman train was run in 1881, but discontinued the next year. Perhaps it was this regular working of 1888 that led a *Punch* contributor to write about this time:

Two first, return, to Brighton, please,
Oh, yes—we'll go in Pullman's car.
I like to travel at my ease;
Two first, return, to Brighton, please.

Joint Enterprise

In a recent paper on relations between the Irish Republic, Britain, and Northern Ireland, Professor Nicholas Mansergh stated: "There has been joint action (between North and South) in respect of hydro-electric schemes . . . and transport involving ministerial conferences in Belfast and Dublin. Such functional co-operation may not be without importance for the future. The fast through train now running experimentally from Cork to Belfast—appropriately named the 'Enterprise'—may perhaps be the herald of co-operation in a widening area of common interest."

Railway Progress in India, 1852

The London & North-Western Railway Company contemplate running loaded trains from Euston Square to Birmingham by express engines in a couple of hours' time. Messrs. Fairbairn, it is said, are now under contract to furnish locomotives competent to the performance of this service, and no person entertains the smallest doubt that the plan will be successfully and easily realised . . . The "progress of locomotion" varies very considerably in different territories of the Empire.

Many years have elapsed since we first advocated the construction of railways in India, and yet the "express" travelling in those parts is still done by "dawk." Everybody saw the other day how long it took General Godwin to get from Umballa to Calcutta over the very ground surveyed for the East India Railway, and how operations suffered in consequence. There is, to be sure, an engine actually dragging trucks in Bombay . . . but there is no portion of a line available for traffic. –*From "The Times," June* 18, 1852.

High Summer

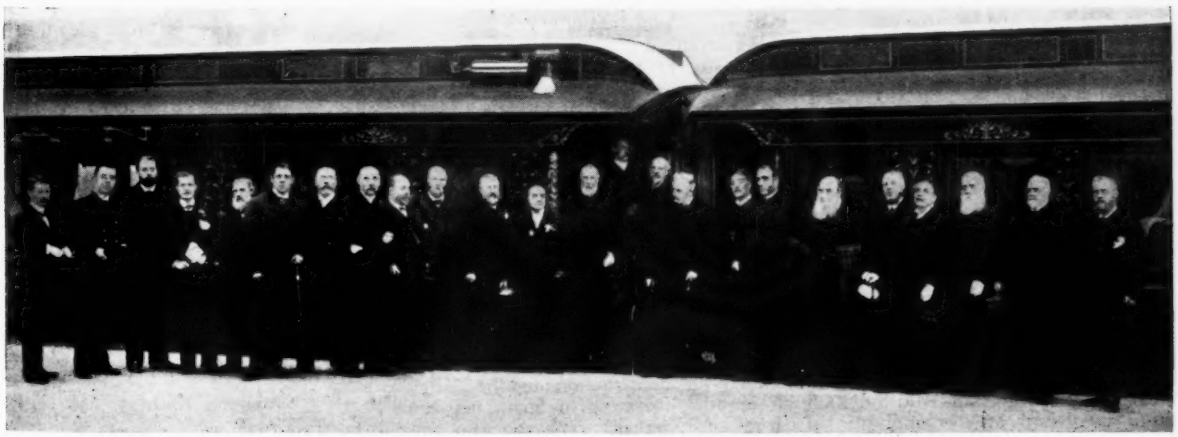
The sun climbs high in a cloudless sky
And crowds are thronging the termini,
Brisk young gentry and sprightly maids,
With brand-new buckets and shining spades,
Hurry from taxi, tube and bus,
Bent on another exodus.

Officials, working round the clock,
Comb the sidings for rolling stock;
They'd like it spick and span and new,
But anything that runs will do.
Anticipation's magic power
Transfigures every fleeting hour.

Off at last, and sharp to time,
Goodbye greyness, grit and grime!
On, through the scented hedgerows,
Where woodbine twines and the foxglove blows,
Past hayfields, cradled in meadowsweet,
And hillsides hazy with hidden heat.

The heat haze dances along the track,
The smiling lengthmen signal back,
Even the year's relentless round
Pauses a moment, wonder-bound.

A. B.



Group at Brighton Station on December 10, 1888, *after the inaugural run of a regular all-Pullman train from London. An earlier service of this type in* 1881 *had been of short duration*

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

CANADA

New Refrigeration Service

A system-wide refrigeration service for less-than-wagonload shipments of perishable commodities has been inaugurated by the Canadian National Express. Under the new system, developed by the C.N.R. Express Department, sections of an express van may be refrigerated while other sections are not. This development will broaden markets for commodities such as cut flowers, fish, yeast, fresh and cooked meats, and other perishable items.

MOROCCO

Djerada-Guenfouda Line

Completion of the 28-mile branch from the Djerada anthracite coal mines in the north-east to Guenfouda on the main line of the Moroccan Eastern Railways (Chemins de Fer du Maroc Oriental) brings anthracite supplies within reach of North African ports. The line, begun in 1949, was finished in April and is now in full operation. Coal traffic, now 600,000 *tonnes* a year, may be raised to 1,000,000 as the demand increases. The line was built for train loads of 1,000 *tonnes*.

Its course in easy profile follows the Metroh valley for the first 18 miles. Masonry work comprised about 130 culverts, from 60 cm. to 6 m. wide, for flood waters, a bridge over the road from Oujda to Bou-Arfa and another over the Oued Touabaa. In the last ten miles the line runs through difficult mountainous terrain in cuttings 50 ft. deep with embankments up to 60 ft. high and seven tunnels with a total length of 2½ miles. Under the Rhourh Pass is a tunnel just over a mile long. The minimum radius curve is 300 m. Diesel-electric traction is used.

BRAZIL

Development Projects

The Export-Import Bank has authorised the first of the series of loans, recommended by the Brazil-U.S.A. Commission, to finance imports of materials for electrical and railway development. Advances, totalling U.S. $41,140,000, have been approved for seven Brazilian subsidiaries of the American Foreign Power Company, and loans of U.S. $8,600,000 and U.S. $7,000,000 are authorised to the Santos-Jundiahy and Paulista Railways, respectively, towards the cost of automatic brakes, couplings and rolling stock. The loans are to be refunded in fourteen half-yearly instalments, commencing in 1955.

The Minister of Communications has approved the programme of improvements for the Rio Grande do Sul Railway, involving an expenditure of £800,000, spread over two years, for labour and materials.

The Sao Paulo Legislative Assembly has approved a law authorising the State Treasury to purchase two-thirds of the shares of the Mogiana Railway. President Vargas has approved the project drawn up by the Brazil-U.S.A. Commission to re-equip the Parana-Santa Catarina Railway. The cost is estimated at £10,623,190, to be expended locally, and U.S. $16,886,000 for materials to be imported. The Export-Import Bank will be asked to advance the latter sum against the Brazilian Government guarantee. The project provides for improvement of the alignment, so as to enable the line to deal with the increasing volume of agricultural traffic. Materials to be imported include diesel-electric locomotives, carriages, wagons, and rails.

The Governors of Sao Paulo and Mato Grosso have arranged a meeting to discuss plans for extending the Araraquara Railway to Cuiaba now and, later on, to Porto Velho in the Guapore Territory. The Araraquara Railway, now being extended across the State of Sao Paulo, has reached a point six miles from the Parana River. The Governor of Sao Paulo also plans to extend the Sorocabana Railway to Dourados, in the extreme south of Mato Grosso, a promising coffee zone.

UNITED STATES

Family Fares

The New York Central System and Chesapeake & Ohio Railway have applied to the Interstate Commerce Commission and the State commissions concerned for leave to introduce a special system of reduced fare charges for children accompanying parents. The plan is that children under 12 years should be allowed to travel free, and that those from 12 to 15 years should travel at half fare. It would apply only to coach (the equivalent of third class) travel, and on the N.Y.C. only when the parent held a round trip ticket which had cost $3.45 or over, but it would be applicable on all trains including coach accommodation.

Reservation charges would be required for all seats occupied, on trains on which reservation is compulsory, but as in Great Britain such charges for the most part are nominal only. It is hoped that this plan will encourage families to choose rail rather than road or air transport; the application is to try it experimentally for 120 days, beginning with the opening of the holiday season on June 25.

Test Run of "Train X"

The first tests have been made by the Chesapeake & Ohio Railway of "Train X"—a train of articulated stock, similar in construction to the Talgo train now operating in Spain between Irun and Madrid. The test run was made on one of the main lines of the Pere Marquette Division, between Grand Rapids and Grand Ledge, Michigan, where there is a 15-mile stretch of straight track, on which, it is reported, a speed of 105 m.p.h. was attained. The individual units of the articulation are 30 ft. long, compared with the normal 85 ft. of modern American streamline coaches, and their floors are only 18 in. above rail level. It is claimed that speeds up to 150 m.p.h. will be possible.

Union Pacific Livery

As an experiment, the pioneer diesel streamline train of the Union Pacific Railroad, the "City of Salina," introduced in 1934, was painted in a brilliant shade known as Armour yellow. Since then the same colour has been used on its diesel-electric locomotives, and on streamline passenger trains, but the remainder of the passenger stock is painted either in two shades of grey or the traditional U.P. dark green.

The management has decided to adopt Armour yellow as standard for all passenger stock. Tests have made it clear that yellow is most conspicuous in all conditions, particularly at night, an important point in view of the large number of unprotected level crossings. "Scotchlite" reflective paint will be used for numbers, lettering, and lining of each car.

INDO-CHINA

Railways Ceded by French

Within the framework of the agreement concluded between France and Vietnam in March, 1949, on Vietnam's independence within the French Union, the Compagnie des Chemins de Fer de l'Indochine was handed over to Tran Van Huu, the Vietnamese, by the French Government on May 26, 1952. This company was one of the last in Indo-China still in French hands, and it has been stated that the handing over of these railways to Vietnam had been delayed at the request of the Vietnam Government, because of the shortage of Vietnam railway officers and technical staff. The system handed over has a route mileage of 1,357.

As a result of the present war in Vietnam the average route mileage actually open to traffic is only 570; despite this, traffic has expanded. Passenger kilometres increased from 19,600,000 in 1946, to 46,100,000 in 1951. In view, however, of the greatly reduced mileage open to traffic it is believed that this expansion comprises both refugee traffic and defence traffic. For the reconstruction of damaged lines and operation of services the French Government incurred an expenditure of 10,438,000,000 francs in 1946-51.

Yunnan Railway

In May, 1946, an agreement between the then Chinese National Government and France and Indo-China confirmed the cession of the Yunnan railway run-

ing from Indo-China into Chinese territory, to the Nanking Government. The transaction was vested in the juridical form of an anticipated repurchase of the railway by the Chinese Government. The amount which would have been necessary for this repurchase was "lent" to the Chinese Government, and the latter undertook to repay it to France by annual instalments. Subsequent political changes have resulted in the question being left in abeyance, but it is known that the Yunnan line is worked by the railway administration controlled by the present Peking Government.

U.S.S.R.

Summer Timetables

The summer service was introduced on May 25-26. Additional trains are provided between Moscow and Baku, Kishinev (Moldavia), Lvov, Erivan (Armenia), Irkutsk and Khabarovsk in the Far East and on the Leningrad-Kiev and Odessa line. More holiday services are run from Moscow to Sochi and Novorossisk on the Black Sea and to Kislovodsk in the Caucasus. In connection with the major construction works on the Don and the Dnieper, new services have been put on between Moscow and Zaporozhye, Rostov-on-Don and Dobrovolskaya, and Tsimlyanskaya and Likhaya.

A further 338 suburban trains have been introduced, principally in the neighbourhood of Moscow, Leningrad, Kharkov, Kiev, and Rostov. At Kaunas and Vitebsk new stations have been brought into operation. New station buildings will shortly be opened at Krasnodar, Odessa and Yasinovataya.

FRANCE

Electrification

The deferment of electrification work on the Lyons - Marseilles section of the Paris - Marseilles line was referred to in the February 15 issue. It is now reported that the S.N.C.F. is studying the possibility of using diesel-electric locomotives on the principal day trains between Lyons and Marseilles whilst awaiting the resumption of electrification.

It is also stated that permission has now been granted for the S.N.C.F. to proceed with the electrification at 1,500 volts d.c. of the network of lines around Ambérieu in the South-Eastern Region, and to begin work on the electrification between Valenciennes and Thionville, on the 50-cycle system.

More Second Class Couchettes

To increase sleeping accommodation in certain international trains, the S.N.C.F. has modified a number of AB (first and second class composite) coaches so as to provide both first and second class couchettes; previously only first class couchettes were provided in these coaches, the remaining accommodation being ordinary second class compartments.

New Metro Extension Opened

The extension of the Paris Metropolitan line, No. 13, from Porte St. Ouen to the Carrefour Pleyel, was opened for traffic on June 30. The length of the extension is about 1¼ mile. It involves a number of changes in the bus services running from the Metro terminus into the suburbs. The Paris terminus of the line is at the Gare St. Lazare.

IRELAND

Faster Service to Killarney

The summer passenger services of Coras Iompair Eireann, effective from June 29, include a "Killarney Express," leaving Dublin Kingsbridge on weekdays at 11.45 a.m., stopping at Thurles and Mallow, and running non-stop on the Kerry branch to arrive at Killarney at 4.12 p.m. This train also serves Farranfore and Tralee, giving a connection to Valentia at the former station.

The return journey also is speeded up, passengers leaving Killarney at 11 a.m. and arriving in Dublin at 3.20 p.m.

During July and August, an additional train to Galway runs from Dublin Westland Row at 12.25 p.m. A train from Galway at 12.30 p.m., arriving Dublin at 4.45 p.m., connects with the "Enterprise" express from Dublin to Belfast.

Publications Received

Directory of Railway Officials & Year Book, 1952-53. London: Tothill Press Limited, 33, Tothill Street, Westminster, S.W.1. 8½ in. × 5½ in. 558 pp. Price 40s.—Possible changes impending in the organisation of British transport, in particular the Government plan to denationalise road haulage, may mean that this volume is the last to include details of some of the transport executives in their present form.

The greatest change in administration of a national railway system which has lately taken place is that in India, where the railways are now grouped in six zones. Although this great project was not completed until April, details of all the new systems have been included, with the names of chief officers where they were received in time for publication. To enable the changeover to be more easily comprehended, entries for the former and the new railways are cross-referenced.

Typographical economies have made it possible to reduce slightly the number of pages without sacrifice of information, and the customary division of the book into "British Commonwealth" and "Foreign" has been preserved. An addition to the Asian section is Nepal, where two systems operate. It has still proved impossible to obtain complete information from some "Iron Curtain" countries, including Eastern Germany. The details of the railways in Western Germany have been substantially revised.

A significant new entry under the heading of international associations is that including particulars of the Pan American Railway Congress Association.

Timber Preservation.—An illustrated brochure, No. 95, issued by Hickson's Timber Impregnation Co. (G.B.) Ltd., reviews the application of Tanalith as a timber preservative, its present uses and its future potentialities. Maximum protection of timber is dependent on the retention of specified quantities and depth of penetration, and an outline of the several methods used is given, together with the equipment necessary, which is shown in illustrations or diagram. These include one of three 90 ft. by 7 ft. 6 in. pressure cylinders operating on Tanalith preservative at the British Railways plant at Ditton for railway sleeper processing. Other illustrations include typical examples of treated and untreated timber which have been exposed to similar conditions of service.

Metrovick Ex-Apprentice Register.—A third edition has been issued of the register of ex-apprentices and ex-trainees published by the Metropolitan-Vickers Electrical Co. Ltd. Dealing with all apprentices and trainees trained at Trafford Park between 1902 and 1949, it includes more than 10,000 names, mostly with short biographies. Numbers of them have remained with the company, rising to important positions, while many others who have left for other walks of life have achieved distinction in their careers. In addition to photographic illustrations of Metrovick products installed in various parts of the world, there are several colour plates of the company's works, and one showing a "3E" class electric locomotive built by Metrovick for the South African Railways heading a train in the marshalling yards at Ladysmith.

Report of the Tin Research Institute, 1951.—The annual report of the Tin Research Institute for 1951 mentions a number of researches which reached the stage of commercial development during the year. Among them was the examination of bearing alloys, including a selection of aluminium-tin alloys which were found to have fatigue resistance superior to tin-base babbitt. Further progress was made with the equipment for producing bars, rods and thick-walled tubes of bronze by casting molten bronze by a semi-continuous method. Twelve publications issued for the first time during 1951. Copies of the report are available without charge on application to the Tin Research Institute, Fraser Road, Perivale, Greenford, Middlesex.

XUM

Design of Valve Gear Joint Pins

Considerations in design to ensure bearing pins are adequate to carry the required load

By Geo. W. McArd, A.M.I.Mech.E.

IN any machine the strength and dependability of the whole always hinges round that of its weakest member, and in locomotives each of the many joint pins in the various gears—valve, spring and brake—is a potential source of trouble. This is recognised in brake and spring gear design, and steps are taken to protect these in modern design by the low shear stress used, and the provision of grease nipples to eliminate rust.

Of the many pin joints included in locomotive construction possibly those in the valve gear are most constantly in use, and for these the desirability of minimising wear ranks almost equally with strength considerations. This is confirmed by the increasing preference for the needle roller bearings for these joints, and a review of the loading incurred in certain joints shows how justified this attitude really is.

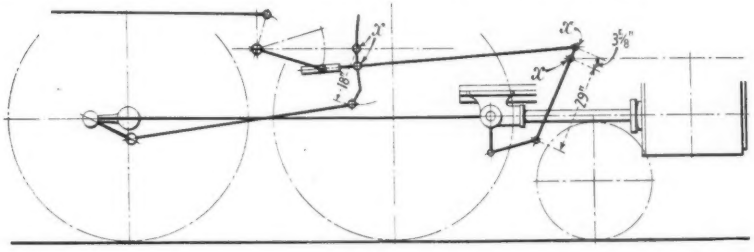


Fig. 1—Diagrammatic arrangement of Walschaerts valve gear for locomotive operation

Design and Load Considerations

The proportioning of valve gear joint pins is done almost invariably on the basis of an empirical formula which for many years has given good results; D/10 where D equals the cylinder bore. This formula has been in use for nearly half a century, and therefore covered, in the early stages, the non-superheated class of engines. It is still used however, the size of the pin being taken to the nearest $\frac{1}{8}$ in. For example, a 20 in. cylinder would call for 2 in. dia. pins, but an 18 in. cylinder would have pins $1\frac{7}{8}$ in. dia.

The load falling on these pins in locomotives which operate at a high rotational speed of the driving wheels is much greater than that experienced on the slower moving engines found in shunting service, and it is worth noting that the conditions may be just as onerous in a fast mineral or goods engine as in one for express passenger duty, since the load depends on factors in which speed only counts from the standpoint of wheel r.p.m., rail speed being quite irrelevant to the point at issue.

The consideration of the loads carried by these pins involves reference to the gear itself and the weight of the parts to be moved and reversed. In Fig. 1, a modern Walschaerts valve gear is shown diagrammatically, the lengths of levers, links, and so on, being as shown, and in Fig. 2 a detail is given of the pin which connects the valve spindle and the combination lever.

The maximum inertia force which comes on this pin at every reversal of the valve's travel, due to the relatively heavy reciprocating masses, can be calculated by assuming the valve to move with simple harmonic motion, from the formula $\frac{W}{g} rw^2$ where—

W = the weight of the reciprocating parts in lb.;

g = acceleration due to gravity = 32·2 ft. per sec. per sec.;

r = half the stroke of the valve in ft.;

w = the angular velocity of the driving wheels in radians per sec. = $(2\pi N/60)$ where N = revs. per min.

Assuming W is equal to a total of 240 lb., the valve travel when running at dia./speed as 4 in. and N as 336, the total applied force comes out at $(240/32{\cdot}2) \times (2/12) \times (2 \times \pi \times 336/60)^2$ = 1,540 lb. approximately.

To this must be added the force required to overcome the frictional resistance of the mass, say, 0·06 × 240 or 15 lb., and an allowance for the retarding effect caused by the radial pressure of the piston valve rings on the steam chest liners. If for the latter a further amount be added equal to the frictional resistance already found, and regarded as a minimum value, the total force which must be applied at the end of each stroke of the valve will be found to equal, in the present case, 1,570 lb.

As the speed of the engine rises the inertia force also goes up, and a case might well be visualised where a high-speed express engine having 6 ft. 8 in. driving wheels and developing its maximum cylinder h.p., reaches a speed of 120 m.p.h. with a valve travel of 4 in. In this case the inertia force rises to approximately 3,460 lb., ignoring the extra due to the piston valve ring resistances and ordinary friction.

During the summer of 1938 when Sir Nigel Gresley was having special tests carried out on the former L.N.E.R. high-speed units, engine *Mallard* reached a maximum speed of 125 m.p.h., and ran five consecutive miles at an average speed of 120·4 m.p.h. The valve and associated details for this engine turned the scales at 218 lb. per cylinder, and the engine would be notched up to run on a short valve travel—let us assume $3\frac{1}{2}$ in. The load on the valve pins in this case (at the lower speed) works out at approximately 2,750 lb. by the formula quoted above.

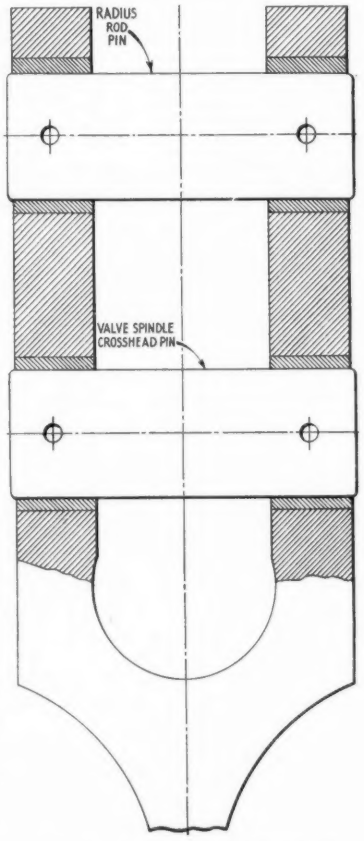


Fig. 2—Valve spindle joint pin

The pin bearing in the case just considered measures $1\frac{1}{4}$ in. dia. and has a length of 2·53 in., giving a projected bearing surface of 3·16 sq. in. and a loading of 870 lb. per sq. in. Admittedly this is a peak figure, and occurs only at the beginning of each valve stroke when the motion reverses in direction, but the somewhat high value indicates the heavy duty which falls to these pins, and, on

account of the rapid reversals, stresses the advantages to be derived by the use of the roller or needle roller bearing.

Knowing the maximum load coming on the valve spindle pin we can then calculate the loads coming on the other pins. Assuming the earlier normal load found on the valve spindle pin (1.570 lb.) we get the load stated for each of the pins quoted:—

Radius rod to combination lever ...	1,396 lb.
Load on die and pin	1,396 ,,
Crosshead connecting link to combination lever	174 ,,
Eccentric rod of reversing link	310 ,,
(Assuming the die to be 4 in. off centre of trunnion pins)—	
Load on link trunnions, with die below trunnion centre	1,085 ,,
Load on link trunnions, with die above trunnion centre	1,705 ,,

The difference between the two last loads served to emphasise the desirability of arranging for the fore-gear position of the die in tender locomotives to be below the trunnion centre in order to be below the trunnion centre in order to minimise wear, as tender engines do so little work normally in back gear.

Walschaerts Valve Pin Design

In view of the angularity of the combination lever at the beginning of each valve stroke, care should be taken to guard against too obtuse an angle when the main crank is on the rear dead centre, an angle not exceeding 135 deg. being regarded as the safe maximum. A higher figure tends to create an axial thrust through the combination lever and impose undesirable loads—and wear—on the valve spindle crossheads and guides.

For Walschaerts gear smaller pins may be used at three locations if desired, because of the greatly reduced loads. Where the value quoted—one-tenth the cylinder dia.—is normal for most pins, the pin which links the eccentric rod to the reversing link may be made from $\frac{1}{4}$ in. to $\frac{1}{2}$ in. smaller in dia. The two pins in the crosshead connecting link can be reduced also, since loads carried by this member are extremely light due to the leverage afforded by the combination lever. The leading pin in the eccentric rod, moving through but a small angle of its periphery in the link bearing, suffers very little wear, but the eccentric or return crank pin sustains considerable wear due to its full rotation, and should be approximately 50 per cent. larger in diameter.

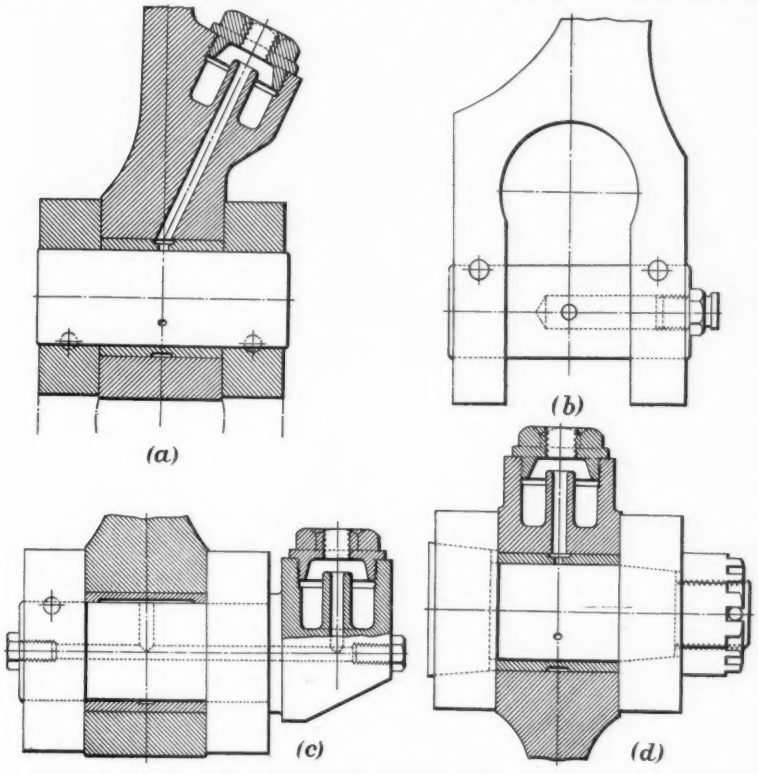


Fig. 3—Alternative design of joint pins as used in modern valve gears

Minimising Wear

In view of the loads found above it is remarkable to note how very efficient modern methods of casehardening these pins have proved, and how relatively small the wear is under good maintenance conditions. Wear does take place, however carefully maintained an engine may be, and where brass bushes are used, as is customary in the eccentric rod bearing for the return crank pin, wear can be heavy. For this reason it is recommended that needle roller bearings should be used for all pins marked X on Fig. 1, with plain or taper roller bearing for the return crank pin.

The design of valve gear joint pins varies, and Fig. 3 shows four types in regular use, that at A being commonly employed where the lubrication of the wearing portion is covered for in the swivelling rod end as shown. Where no oil cup is provided, a similar design of pin may be used with a grease nipple screwed in on the outer centre of the pin, passages being bored as shown for the grease to reach the vital surface (see B).

The forged pin shown at C is commonly used, and has the merit of simplifying the design of the rod end and avoiding awkward machining operations.

Sometimes the taper pin seen at D is chosen—recent engine designs suggest that this pin is becoming more frequently used—and although it is somewhat more costly it has a big advantage in that it maintains the designed location of the arms of the forked end where a parallel pin would permit spreading.

SOUTHERN REGION OCEAN LINER EXPRESSES.—The boat express composed of Pullmans and ordinary first class stock running between Waterloo and Southampton Ocean Terminal in connection with Cunard Line R.M.S. *Queen Mary* and *Queen Elizabeth* has been named "The Cunarder." A specially designed headboard, in the form of a shield, is carried on the front of the engine, with nameboards on the coaches. The inaugural run of "The Cunarder" was on July 2, when the train left Waterloo at 7.5 p.m., hauled by "Merchant Navy" class locomotive No. 35004 *Cunard White Star*. A similar Waterloo-Southampton boat express in connection with United States Lines ss. *United States* has been named "The Statesman."

ELECTRICAL DISCHARGE FROM BUSES.—A letter has been sent by London Transport to Mr. C. C. Poole, M.P., who asked a question in the House of Commons on June 23 regarding electric shocks received by passengers from the handrails of London buses. The letter explains that shocks may occur due to a discharge of static electricity built up within the vehicle when in motion. They are liable to arise only in fine, cool weather with low humidity, a combination of circumstances that does not occur frequently in Great Britain. While the charge produced may be built up to a high voltage, the duration of the discharge and amount of energy involved is infinitesimal. There is no record of any injury, burns or other adverse after-effects as a result of shocks sustained by people touching the vehicles. In conjunction with tyre manufacturers it was found that shocks could, to all intents and purposes, be eliminated by the use of special electrically conductive rubber in the tyres. In 1948 London Transport adopted these tyres as standard, since when public complaints have diminished to such an extent that they can now be regarded as negligible. London Transport has taken all practicable steps to overcome the problem and deal with the causes as far as they are known at present, but research workers are now inclining to the view that the modern trend towards non-skid road surfaces may be contributing to conditions conducive to the production of static charges in certain stretches of road, or, alternatively, of a rate of charge temporarily beyond the discharge capacity of vehicle tyres. These further aspects are now being examined.

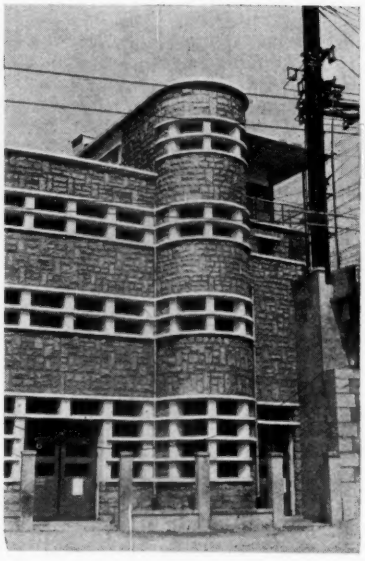
Paris-Lyons Electrification Completed

New works, motive power and maintenance facilities now ready for intensive user of the main line

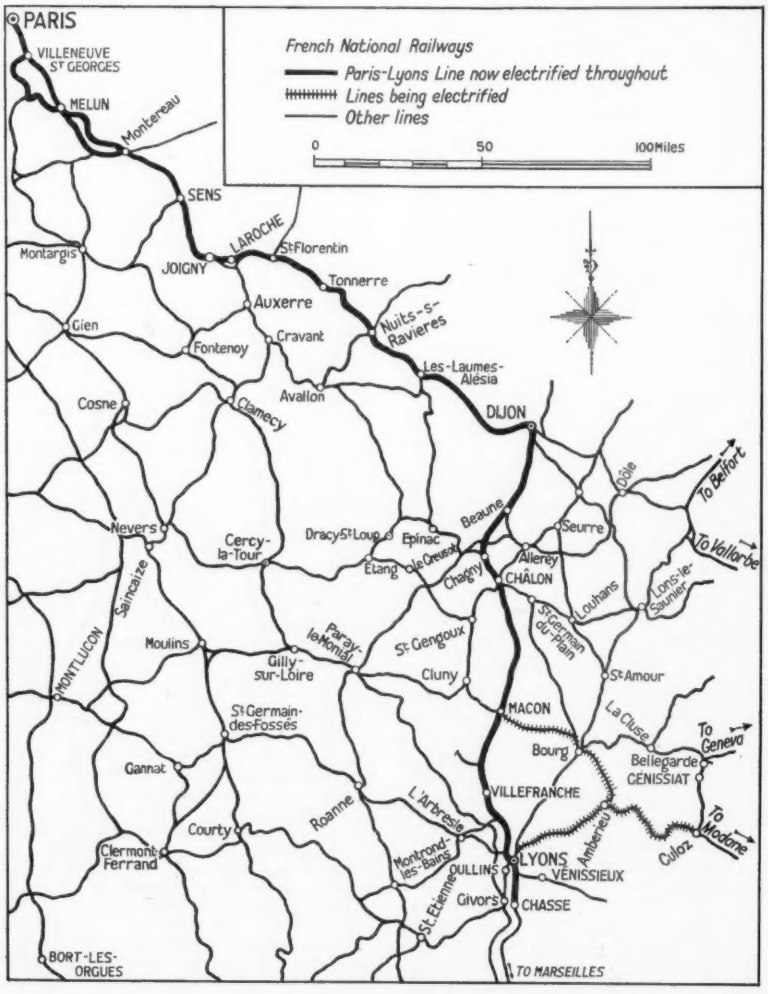
ELECTRIC working of trains throughout from Paris to Lyons began on June 24, thus realising the ambitious project of the French National Railways for the conversion of this main line to electric traction. Bound up with the scheme are radical changes in operating methods and procedure, which in turn have necessitated much civil engineering and resignalling work. All these developments have been justified by the desire to exploit the advantages of electric traction to the utmost.

The various stages by which the complete electrification has been brought into being were recorded in our June 27 issue. The electrical installations on the section just opened are similar to those on the other portions of the line, which came into full operation in March, 1950 (Laroche-Dijon), August, 1950 (Laroche-Paris), and January, 1952 (Dijon-Chalon).

Some of the wider implications of the scheme were referred to by Monsieur Armand, General Manager of the S.N.C.F., in a speech on the inaugural day (see our July 4 issue). He said there were 64 passenger trains daily between Paris and Dijon, the number going up to 90 at peak periods, and 42 between Dijon and Lyons. Before electrification freight traffic was 10,000 *tonnes* a day. To take advantage of electric traction, freight trains formerly running to Paris *via* Nevers or Bourg would now be routed *via* Dijon. Eventually the freight traffic on this route would exceed 20,000 *tonnes* daily. As an instance of economies, it was pointed out that between Dijon and Lyons pre-stressed reinforced concrete pylons as catenary supports had effected a saving of 1,600 *tonnes* of steel.



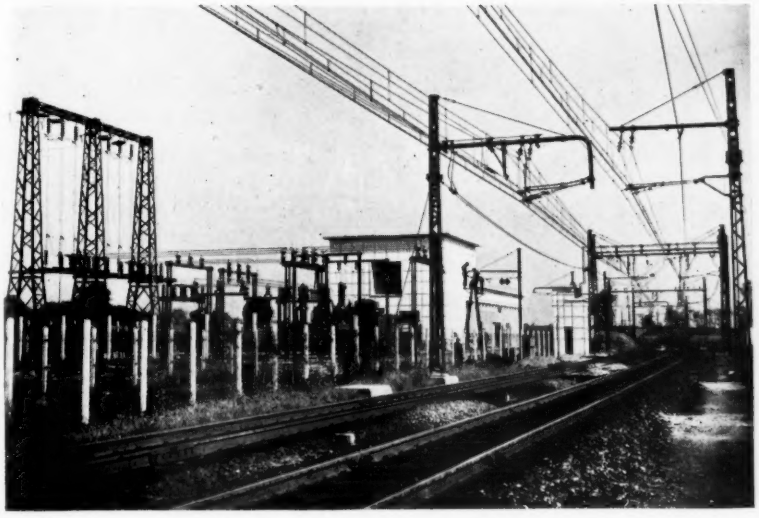
Lyons Perrache No. 2 signalbox



Paris—Lyons main line and connections, including routes from which traffic is being diverted on to the new electrification

For traction, 231 electric locomotives had replaced 600 steam locomotives. These included 35 of the 2-Do-2 type of 4,800 h.p. Improvements had increased their power by 25 per cent. and their adhesive weight by 10 per cent. They could haul the heaviest passenger trains at speeds up to 140 km.p.h. The Bo-Bo class of 135 2,800 h.p. locomotives was exceptionally economical and flexible in its applications, being able to haul freight trains of 1,500 *tonnes* on the Paris-Dijon line at 75 km.p.h. (47 m.p.h.) and passenger trains of 500 *tonnes* at more than 100 km.p.h. (60 m.p.h.). Sixty Co-Co 4,350 h.p. locomotives were under construction, a new type with all six axles motored which was simpler, lighter and more economical and costing 20 per cent. less than the 2-Do-2. A general review of new motive power for the Paris-Lyons line appeared in our July 15, 1949, issue. The prototype Co-Co was described in our June 10, 1949, issue, and the 2-Do-2 in our issues of July 14, 1950, and October 12, 1950.

Other inaugural speeches stressed the economic advantages of electrification. M. Morice, Minister of Public Works, said the electrification meant a yearly saving of 620,000 tons of coal, increases in average speed of trains to 120 km.p.h. (75 m.p.h.) and in the weight of trains from 500 to 700 and even 900 *tonnes*, representing an annual economy of fr. 6,500 thousand million (£6,500,000). The next step in the programme would



Substation near Macon, typical of the supply arrangements on the Paris—Lyons main line

be the single-phase 50-cycle electrification of the Valenciennes-Thionville line with its heavy industrial traffic.

Considerable acceleration of passenger services will be effected in the winter timetables, effective from October 5. Six non-stop runs from Dijon to Lyons Perrache which now average slightly under 132 min. will average 115 min. "Le Mistral" will be allowed 101 min., against 121 min. at present, and its time from Paris to Lyons will be 4 hr. 15 min., against 4 hr. 41 min., and to Marseilles (536 miles) 8 hr. 10 min., against 8 hr. 32 min., whilst Nice (676 miles) will be reached in 11 hr. 15 min. The "Blue Train" will be allowed 121 min. from Dijon to Perrache, 10 min. less than at present; it will reach Nice in 13 hr. dead from Paris. The evening *rapide* from Paris to Lyons (train 15, all classes) will run from Dijon in 116 min., against 140 min. at present, with three stops, and will reach Perrache in 4 hr. 34 min. from Paris, an acceleration of 26 min.

Civil Engineering

The most important works are those which have been carried out in the Lyons district either as a direct consequence of the electrification or in connection with it. The section concerned extends for some 40 km. between St. Germain-au-Mont-d'Or to the north and Chasse to the south of the city.

The layout at Lyons is particularly complex. The main line splits at Collonges-Fontaines, whence one route, followed by the majority of passenger trains, first keeps west of the Saône, then crosses it and the Rhône; on the neck of land between the rivers stands Perrache, the main passenger station. The other route, after crossing the Saône and Rhône further north, and receiving at St. Clair lines from Bourg (Belfort and Strasbourg) and Ambérieu (Geneva and Italy *via* Modane), serves Brotteaux Station and joins the first-named route at Guillotière, south of Perrache.

Perrache occupies a restricted site with river bridges at each end. In summer more than 300 passenger trains are handled daily. On an average some 16,000 passengers enter, leave or change trains. The yards handling fast goods traffic are Chasse (22 km. south of Perrache) and Guillotière, immediately south of the city. At Chasse in particular are formed up fast trains, composed of wagons with perishables from the South; between 1,400 and 1,500 wagons are handled daily. At Guillotière down fast goods trains discharge consignments for the Lyons district and load for destinations in the South. There is a mechanised goods shed.

The two principal yards for slow goods traffic are St. Germain-au-Mont-d'Or, 20 km. north of Perrache (mainly north-south traffic) and Badan (mainly south-north traffic). Vénissieux, close to Guillotière, is concerned with traffic for local branches.

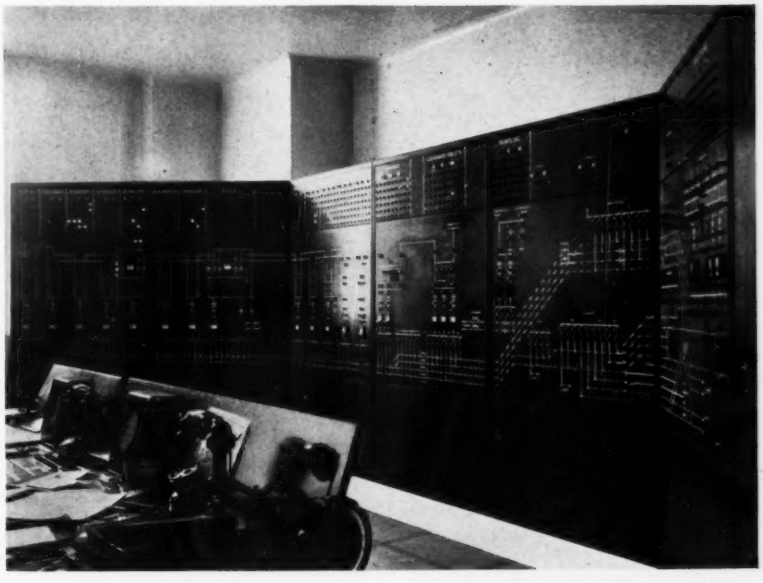
Brotteaux Station, although in some respects better placed, and a more modern structure, than Perrache, has not developed to the extent originally envisaged. It is used by some slow main-line trains and by trains from Perrache and from the South to Geneva, Savoy, Strasbourg, and so on.

Relieving Congestion at Lyons

The two principal hindrances to traffic passing through Lyons have always been the congestion at Perrache, and on the double track (Brotteaux) line between St. Clair and Guillotière. At Perrache, the nine through platforms have been lengthened and are now between 290 and 510 m. long. Four of the five tracks over the Rhône have been signalled for reversible working (*banalisation*). At both the north and south ends there are now three bays for railcars, with stabling roads.

Quadrupling between St. Clair and Guillotière, where the line is either in cutting or on embankment, is in progress. Many bridges have been widened and two flyovers have been constructed between Brotteaux and St. Clair to ensure that main-line goods traffic and south-to-east passenger traffic are kept separate.

Some of the work necessary to give sufficient clearance for the electrical equipment was begun during the war, including lowering the track in St. Irenée Tunnel, between Vaise and Per-



Remote supervisory control room at Lyons, with mimic diagram of the power network, substations, and catenary system

rache. Some 30 other structures have had to be altered to provide for 23-*tonne* axleload electric locomotives and an increase in maximum speed to 140 km.p.h.; 150 km. of track have been relaid.

Automatic colour-light signalling will allow a 3 min. headway, compared with 8 min. with manual signalling, between St. Germain-au-Mont-d'Or and Chasse, *via* Perrache or Brotteaux. Track circuits have been changed from d.c. to a.c. Thirteen new signalboxes have been built and 15 altered or re-sited. Seven sub-stations have been built for signalling, and three for traction (Quincieux, Grands Violets, and Guillotière).

Of particular importance is the extension of St. Germain-au-Mont-d'Or of its new status as the junction for the Ambérieu-Chambéry-Modane line, which will ultimately diverge at Mâcon, instead of Dijon, and the concentration on the main line of goods traffic formerly routed between Lyons and Paris *via* Ambérieu, Bourg, and Dijon, or *via* Paray-le-Monial and Moulins (the Bourbonnais line). The former branch to Bourg, henceforward to be followed by all principal trains from Paris to Culoz and beyond, diverged by a flat junction, but a flying junction has been substituted.

The four tracks through Mâcon station have been increased to five, two for Lyons and two for Ambérieu traffic, and an additional middle road which may be used by either. The work has entailed excavating the cutting north of the station and widening the embankment south of it. Road bridges have been altered and the two former signalboxes have been replaced by one electric box.

New flyover at Macon taking the Paris—Lyons down line over the branch to Bourg, henceforward to be followed by all principal trains from Paris to Culoz and beyond

Yard. The running lines have been relaid to permit higher speeds and the length of the siding roads has been increased to 800 m. Certain trains formerly marshalled at other yards in the district are now concentrated here. The enlarged yard has 14 reception and 35 sorting roads capable of dealing with 2,500 wagons a day. Considerable earthworks, diversion of highways and alteration of structures were entailed. A reinforced concrete suspension bridge, which spans the main tracks, was described in our January 26, 1951, issue.

Mâcon gains in importance by reason

Electric Locomotive Maintenance

Plans for dealing with the overhaul of electric locomotives used on the Paris-Lyons line were drawn up as soon as it was decided to electrify. They involved the conversion for this purpose of the steam locomotive repair shops at Oullins, near Lyons, and the undertaking of diesel-electric maintenance at the same depot. Since the war the French National Railways have taken back the workshops at Nevers-Vauzelles, which had been rented to the Compagnie Générale de Construction et d'Entretien de Materiel de Chemins de fer, and are now using them for overhauls of South-Eastern Region steam locomotives formerly undertaken at Oullins, so that no inconvenience has resulted from the conversion of the latter establishment to its new purpose.

Electrical work at Oullins began in 1947, when armature repairs for locomotives on the Culoz-Modane section were transferred there from Chambéry. In the next year the shops undertook repairs from the South-Western Region, which had on hand a programme of armature rewinding, general maintenance, and rewiring that exceeded its own workshop capacity. At the present time all electrical repair work for the Culoz-Modane line has been concentrated at Oullins. Work on South-Western Region locomotives continued up to the time of the full flow of repairs for the South-Eastern Region getting under way. Arrangements have been made for alternative supply to one of the tracks serving the depot of power at 1,500 V. d.c. or 20,000 V., 50 cycle, single phase a.c., the intention being to repair at Oullins the various classes of locomotives of which prototypes are now running on the Annecy to La Roche sur-Foron section.

The equipment and staffing of the shops have been planned on the basis that general overhauls should not take more than five or six days. Mileage between visits to the shops for this purpose is about 155,300, or roughly the same as with steam locomotives, but the daily mileage covered is often three or four times as high as that of steam units, so that the frequency with which locomotives become due for repairs is increased.

Every effort has been made therefore to save workshop time and reduce handling by convenient layout of premises and the provision of mechanical aids. A 160-*tonne* outdoor traverser, with its track on the surface instead of in a pit (the first of this kind in France) serves nine stabling tracks for electric locomotives and railcars. Another nine tracks are accessible direct from the running lines. Inside the assembly shop there are twelve locations for locomotives and six for railcars, these being situated at the two ends of the building. The central portion is used for the repair of motors, bogies, brake gear, and suspensions. A motor test bed has been installed, with four generators arranged for use in various combinations to give currents from two to 1,200 A. for testing by the Hutchinson system. Two traction motors and one auxiliary motor can be tested at the same time. The winding shop is equipped with a Gisholt electronically-controlled armature-balancing machine for armatures weighing between 150 lb. and 1 ton 6 cwt. Larger armatures are balanced on a machine with piezo-electric recording apparatus designed by MM. Lebon and Mauzin of the French National Railways.

Special equipment in the winding shop includes an oven designed for a temperature of 350° (instead of 200° as used formerly) with a view to the eventual use of silicone insulation.

Simplified Controllers for Shunting Tube Stock

Equipment accommodated in car end panel

A NEW type of tube car is being introduced on the Northern and Bakerloo Lines of London Transport to operate with the 1938 tube stock. It is fitted with a simplified type of driver's control equipment for shunting purposes, designed to make available the maximum passenger accommodation.

Hitherto it has been the practice for this stock to be made up into 3- and 4-car units having a driving cab at each end, so that a 7-car train can be divided into two separate units. In most cases when trains are reduced in length after the peak service, only one unit remains in service, the other returning to a depot or siding near the uncoupling point. The provision for this purpose of a full driving cab with all equipment is not only expensive but also results in reduced passenger accommodation.

A further important consideration is the increased distance between passenger doors when two driving cabs are adjacent, which causes local crowding on the platform in peak service and consequent increase in station stop time.

To make this possible the driving equipment in the new cars has been reduced to a minimum and has been housed in a cabinet let into the end panel of the car similar to the normal arrangement of the guard's door control equipment. The equipment provided is adequate for all normal shunting movements, and in addition to the control cabinet includes an automatic coupler and a tripcock. The latter is considered essential as some of the shunting movements take place on service tracks where automatic signalling with train stops is in use. Electric marker and tail lights are fitted on the headstock and a bracket is provided for an oil lamp in emergency.

The main items of equipment in the shunting control cabinet are shown in the illustration, where they are identified by the figures quoted in the following brief descriptive notes:—

(1) Push-buttons, situated in upper part of cabinet, for control of tail and marker lights, overload relay reset, and control governor cut-out.

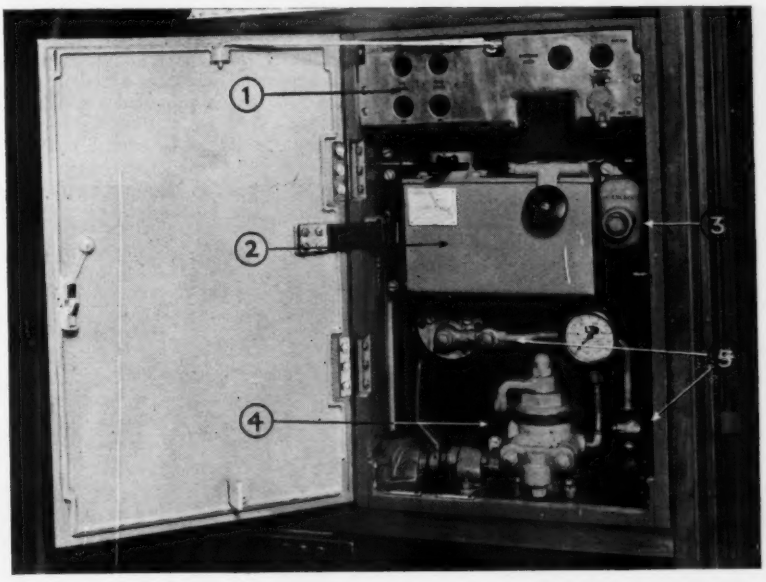
(2) Master controller unit incorporating a selector switch (operated by the driver's master controller reverser key) and a large push-button switch for operation by the palm of the hand. The selector switch has two positions—"shunt" and "series"—whilst the push-button takes the place of the operating handle in a normal master controller.

(3) An interlock switch, connected in the passenger door interlock circuit, which is "made" when the cabinet door is closed, thus ensuring that the cabinet must be properly closed when not in use. The cabinet door lock is key-operated.

(4) Brake equipment, consisting of a No. 6 driver's brake valve fitted with pressure-limiting check valve and train line pressure gauge, a key-operated isolating cock for the brake valve, and a hand-operated isolating cock for the tripcock. The two isolating cocks, illustrated in the closed position, are mechanically interlocked with the cabinet door so that both must be in this position before the cabinet door can be closed.

(5) Whistle valve and isolating cock controlling a standard pneumatic whistle fitted on the outside end panel of the car.

When using this driving position the motorman observes the track through the central corridor door and operates the master controller or the brake valve as required with his left hand. Seventy new cars of this type are being manufactured and a further 22 are being provided by converting non-driving motor cars of 1938 tube stock.



Control equipment mounted in car end panel

Fastenings for Flat-Bottom Railway Track—1

Characteristics of the various types now in general use or undergoing tests on British Railways

SINCE the introduction of the 109-lb. and 98-lb. flat bottom rail on British Railways, considerable trial and experiment has taken place with different types of baseplates and fastenings, with a view to ascertaining the most economical and efficient types for general use.

From the early days of railways until more recent times, flat-bottom track was secured direct to the sleepers with dog spikes, but latterly increasing use has been made throughout the world of cast iron or rolled steel baseplates between the rail and the sleeper, in order to spread the load over a much larger area of the sleeper than is the case where the rail foot bears directly on it. The baseplate also forms a bearing for the foot of the rail and allows a more rigid fastening to be obtained. Where hardwood sleepers are used, baseplates are sometimes dispensed with.

Elastic spikes and B.R.1 baseplates in 113-lb. F.B. track

Mills loose jaw and taper key fastening

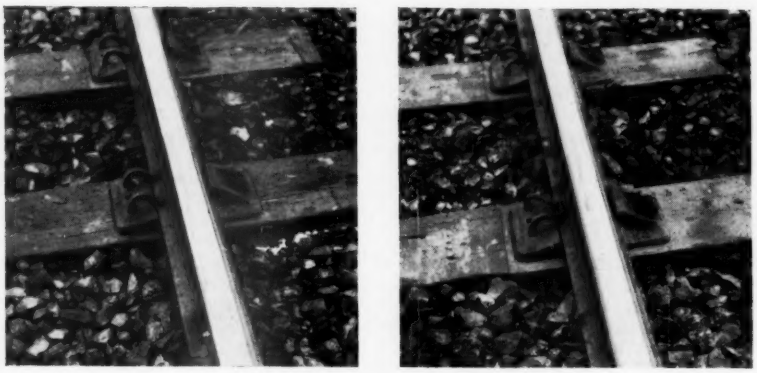
The three most common methods in use at the present time are:—

(*a*) The use of steel baseplates and square spikes with large heads which slightly overhang the edge of the rail foot, serving to hold the rail to the baseplate and the baseplate to the sleeper. There is a tendency with this type of fastening for the wave motion of the rail under traffic to raise the spikes slightly, thus reducing the pressure on the rail foot. This leads to the provision of rail anchors in order to prevent extensive rail creep. As an alternative to the above method, it is the practice in some Continental countries to use mushroom-headed screws to secure the rail direct to the sleeper, either with small baseplates where softwood sleepers are used, or without baseplates in the case of hardwood sleepers.

(*b*) Rigid or spring steel clips with suitable bolts to hold the rail to the baseplate, and screws to hold the baseplate to the sleeper. This method has much to commend it, as an excellent grip on the rail foot is provided when the nuts of the clip bolts are tight, and the renewal of rails can be carried out without disturbing the fastenings. Its chief disadvantage lies in the increased maintenance necessary in keeping the large number of nuts and screws tight.

(*c*) The third method consists of the use of spring spikes performing the double duty of holding the rail to the baseplate and the baseplate to the sleeper. Where correctly maintained, a good grip is ensured on the rail foot. The specially-shaped head of the spike absorbs any movement due to the wave motion of the rail, thus enabling the spike shank to maintain its hold on the sleeper, while there is good resistance to rail creep.

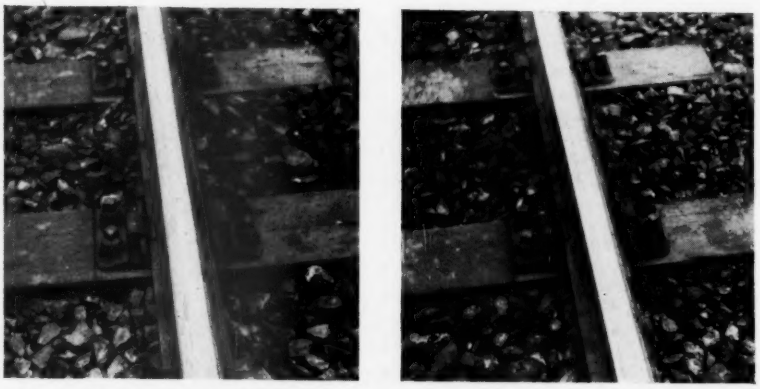
Up to the present most F.B. plain track on British Railways has been laid with type (*c*) fastenings, and type (*b*) with spring steel clips has been used chiefly for switch and crossing work.



B.R.3 baseplates with Elastic spikes (left) and Macbeth spike anchors (right) in 109-lb. F.B. track

Design of Baseplates

As the Elastic rail spike and the Macbeth spike anchor had both been in use with the 113-lb. and 110-lb. F.B. rails prior to nationalisation, it was decided



109-lb. F.B. track with Hey-Back fastenings, showing cast-steel baseplate on left and cast-iron baseplate on right

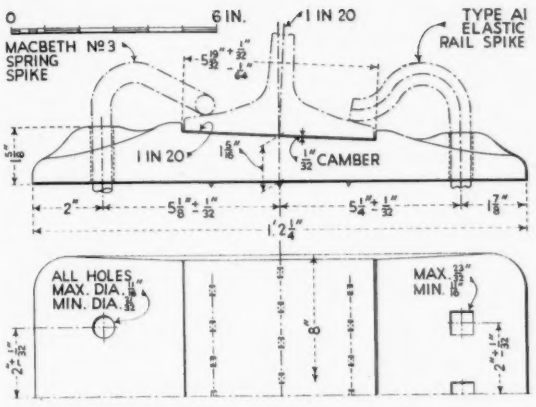


Fig. 1—Dimensions of B.R.1 and B.R.2 baseplates

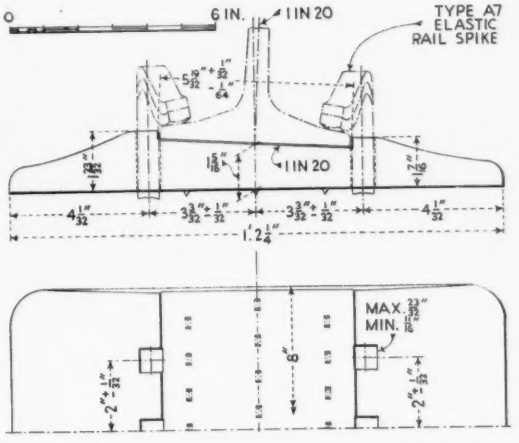


Fig. 3—B.R.4 baseplate for Elastic rail spike

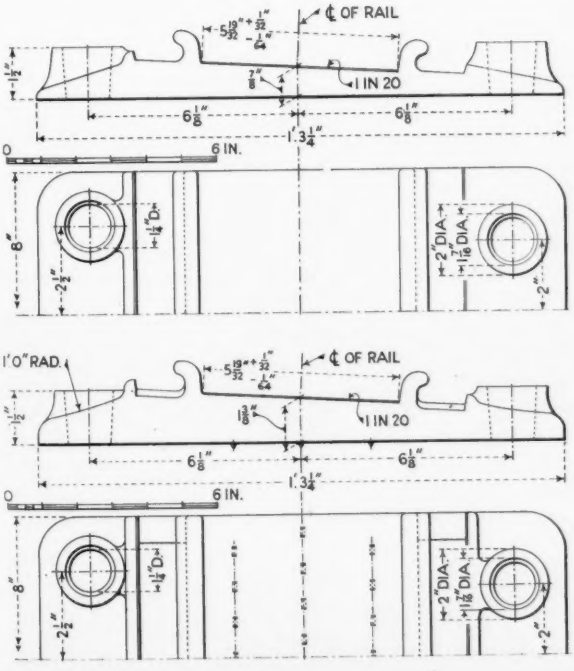


Fig. 5—Hey-back type baseplate

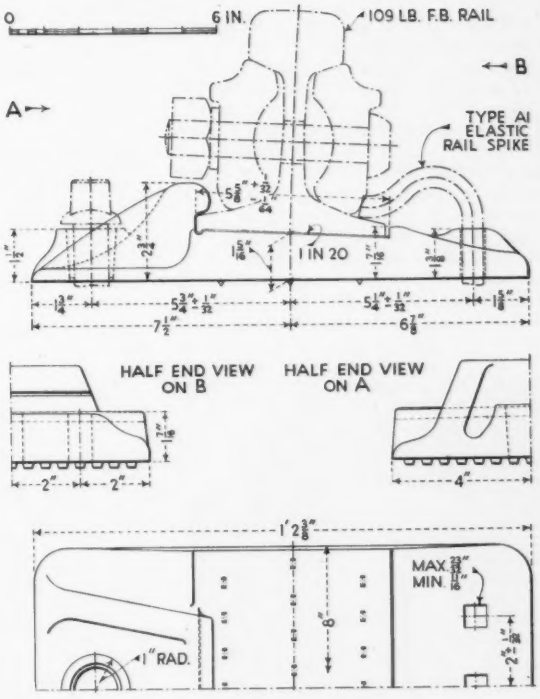


Fig. 2—B.R.3 baseplate

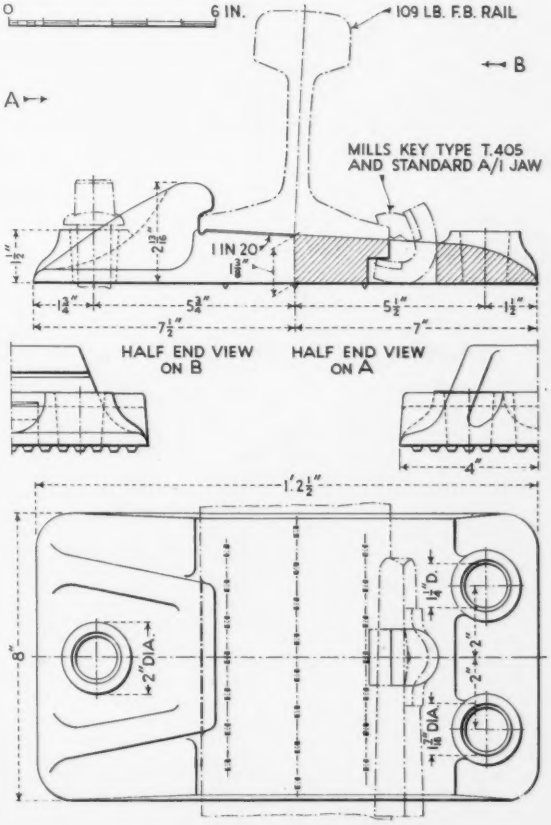


Fig. 4—Special baseplate for Mills fastening

to design in the first place baseplates suitable for use with these fastenings for plain line. These baseplates, the B.R.1 and B.R.2, are now in general use, and as can be seen from Fig. 1, the general difference lies in the holes for the spikes on the B.R.2 being round to suit the Macbeth Spike Anchor, although it has been found in practice that this can be used satisfactorily in the square holes of the B.R.1 baseplates. These baseplates are provided with tolerances both on the rail seat and in the spike holes to allow for inequalities in casting.

In the B.R.1 baseplate six spike holes are provided, only three being used in

Tee-bolts and spring clips in S.T. baseplate in 109-*lb. F.B. track*

the first instance, the additional holes being provided to allow of extra spikes being used where rail creep occurs or alternatively to allow of the position of the spikes being changed should splits develop in the timber.

The B.R.1 S baseplate has also been designed, this being the rolled steel counterpart of the B.R.1 baseplate.

Next, the B.R.3 baseplate (Fig. 2) was developed with a view to ascertaining whether previous fixing of baseplates to the sleepers with one chair screw, at the sleeper depots, would facilitate the pre-assembly of track; it is also being compared with the B.R.1 and B.R.2 types, to see whether it maintains better gauge and greater resistance to side thrust. This baseplate is of cast iron and has an overhanging lip on the outside of the rail foot and three square holes on the inside. A standard chair screw is used for holding the baseplates on the outside of the rail, and usually two Elastic rail spikes or a Macbeth spike anchor on the inside.

The B.R.4 baseplate (Fig. 3) has been designed to allow of a "T" pattern Elastic rail spike being used. It is claimed that this type of fastening is suitable where there is a marked tendency to creep, and can be used either with or without baseplates. The fastening is described later in this article. A special baseplate has been designed for use with the fastenings known as the Mills loose jaw and taper key, the features of which are described later in this article, and which is at present under trial (Fig. 4). A further type of baseplate under trial is the "Hey-back," incorporating key-ways which receive the special spring fastenings described later (Fig. 5).

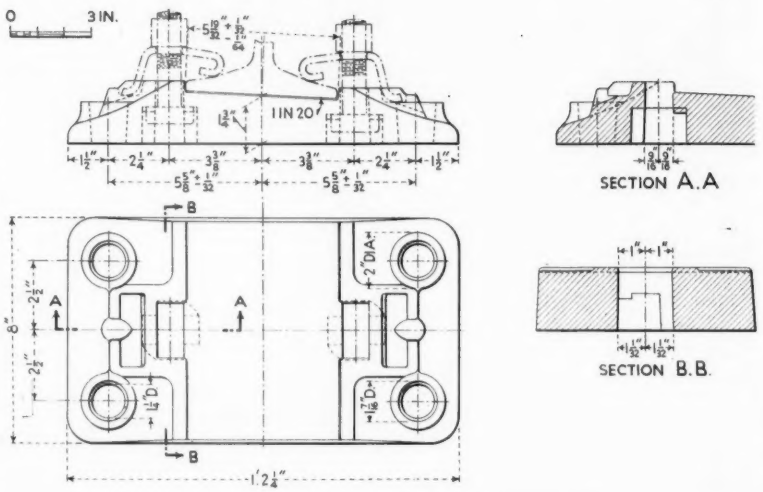


Fig. 6—Dimensions of the S.T. baseplate

In addition to the foregoing, many types of special baseplates have had to be designed to cover the varying requirements of switches and crossings, the fastenings in this case normally being of the spring clip type. An example of these baseplates is shown in Fig. 6.

A feature common to most plain track baseplates is the provision of small nibs on the underside. After the passage of a few trains these nibs sink into the surface of the sleepers and materially assist in preventing spread of gauge. The rail seating of the baseplate is slightly cambered longitudinally so that a rail normally bears full on the centre portion of the sleeper. When a wheel reaches a point on a rail mid-way between two consecutive baseplates, the rail bends slightly under the load, the camber on the rail seatings allowing this bending to take place without causing a rocking of the baseplates towards the bend. This allows of the wave motion of a rail under traffic taking place without causing rocking of the baseplates.

(To be continued)

DOME OF DISCOVERY ESCALATOR.—London Transport has purchased from the demolition contractors the escalator which was used in the Dome of Discovery at the Festival of Britain. It is to be installed as soon as possible at Alperton Station (on the Piccadilly Line) where passengers have to walk up from the ticket hall to the platform. The escalator was built by J. & E. Hall Limited.

LONDON BUSES VISIT CANADA.—In response to many requests, the three London double-deck buses which recently completed an 8,000-mile, coast-to-coast goodwill tour of the U.S.A., sponsored by the British Travel & Holidays Association in co-operation with the London Transport Executive, are now visiting Canada before returning to Britain. After a special farewell ceremony in New York on July 8, they travelled to Montreal and from there will visit many of the leading cities and towns in Canada. Places where the buses will be on show in Canada include Ottawa, Peterborough, Toronto, Hamilton, Trenton, Stratford, Kingston, and London (Ontario). The buses will complete their tour on August 2 and will sail for Britain as soon as possible after that date. They will then have completed well over 12,000 miles (the Atlantic crossing apart) and will have been seen by millions of people in the two countries. In Boston the drivers brewed a pot of tea on the site of the "Boston Tea Party."

STEEL IMPORTS THROUGH HULL.—Imports of iron and steel into Hull during recent weeks have been six times as great as those being handled a year ago, and much of the current traffic is new steel from the U.S.A. and the Far East. Amongst recent arrivals at the port was a cargo of 4,335 tons of steel ingots and slabs brought by the ss. *Eugene Lykes*. This vessel berthed at King George Dock, Hull, at 7 a.m. on June 24, and left again on the evening tide of Thursday, June 26. Dockers and Docks & Inland Waterways Executive staffs were occupied with the cargo throughout the three days, and on June 26 discharged 2,030 tons from the ship.

ALUMINIUM DEVELOPMENT ASSOCIATION.—An abridged annual report issued by the Aluminium Development Association records various branches of work undertaken during 1951 on behalf of the Railway Executive. A study was made of weight saving in rolling stock, leading to the conclusion that lighter weight was of optimum value on intensive suburban services. The Association also gave technical advice on the use of aluminium alloy for floor panels in rolling stock and carried out work on the design and suitability of various types of alloy for luggage racks, brackets, and many other interior fittings. Recommendations were made for a section and alloys suitable for semaphore signal arms.

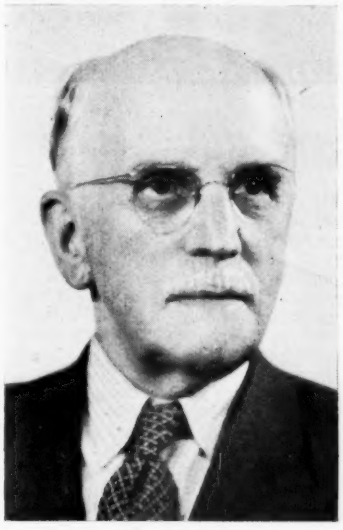
RAILWAY NEWS SECTION

PERSONAL

The Queen, on July 8, at Buckingham Palace, conferred the honour of Knight Commander of the Royal Victorian Order on Mr. Victor Michael Barrington-Ward, Member, Railway Executive.

Mr. R. O. Stewart, Assistant Chief Engineer, Construction, Canadian National Railways, has been appointed Chief Engineer, in succession to Mr. Barton Wheelwright, who retired at the end of June.

Mr. Alfred Charles Illston, A.M.I.Mech.E., M.I.Loco.E., Deputy Chief Engineer, Office of the Crown Agents for the Colonies, who, as recorded in our June 13 issue, received the O.B.E. in the Queen's Birthday Honours List, was born in 1887 and educated at Hartley University College, Southampton, and the Northern Polytechnic Institute, Holloway. Between 1901 and 1906 he served an apprenticeship with the L.S.W.R. and in 1907 became a junior draughtsman. Mr. Illston went to the Westinghouse Brake Company in 1909 as Brake & General Engineering Draughtsman and in 1914 was appointed Chief Assistant Draughtsman, Carriage & Wagon Works, L.B.S.C.R. In 1917 he went to Palestine as a sapper in the Royal Engineers, Railway Operating Corps, and after being commissioned was Officer-in-Charge of the R.E. Workshops in Palestine. Following his return to civil life in 1920, Mr. Illston entered the Crown Agents' Design Department as Engineering Assistant and was promoted Assistant Engineer in 1926 and Deputy Chief Engineer in 1948. In his present capacity he is in charge of the branch responsible for technical work connected with the purchase, design and manufacture of steam, diesel-mechanical and diesel-electric locomotives, carriages and wagons, cranes (railway, workshop and dock), railcars, and trolley and inspection cars for various railway administrations in the Colonies, Ceylon and Iraq.



Mr. A. C. Illston

Deputy Chief Engineer, Office of Crown Agents for the Colonies, who has received the O.B.E.

Mr. R. M. L. Lemon, Administrative Assistant to the General Manager, East African Railways & Harbours, has been appointed Chief Establishment Officer.

Mr. John Houlden, M.B.E., Acting Chief Accountant of the General Mitre Railway, Argentina, who, as recorded in our June 27 issue, has retired to take up residence in England, joined the Chief Accountant's Department of the Central Argentine Railway in February, 1925, and became Chief of the Works Accounts Section in 1932, and also of the Stores Accounts Section some three years later. In 1942 he was appointed Chief of the Traffic Accounts Section and also Assistant Chief of Expenditure Audit. After becoming Chief Book-keeper in January, 1946, he was promoted to Chief of the Finance Division in 1947 and to Sub-Accountant in 1949. On the retirement of Mr. Robert Flack last year he became Acting Chief Accountant. Mr. Houlden is Chairman of the British Employees' Committee, and for his activities in this connection received the M.B.E.

Mr. John Houlden

Acting Chief Accountant, General Mitre Railway, Argentina, who has retired

SOUTH AFRICAN RAILWAYS APPOINTMENTS

The following changes have been announced in the Senior Officers of the South African Railways Administration:—

Mr. T. V. More, System Manager, Port Elizabeth, as System Manager, Cape Town.

Mr. C. S. Middlewick, System Manager, Windhoek, as System Manager, Port Elizabeth.

Mr. W. W. E. Rawlinson, Superintendent (Claims), Headquarters, as Relieving System Manager, Headquarters, Johannesburg.

Mr. B. D. Reid, Superintendent (Staff), Headquarters, as Relieving System Manager, Headquarters, Johannesburg.

Mr. J. P. Hugo, Administrative Secretary to the Minister of Transport, Pretoria, as System Manager, Windhoek.

Mr. J. A. Cussons, Port Goods Superintendent, Cape Town, as System Manager, East London.

Mr. W. E. King, Works Manager, Vulcan Foundry Limited, has retired.

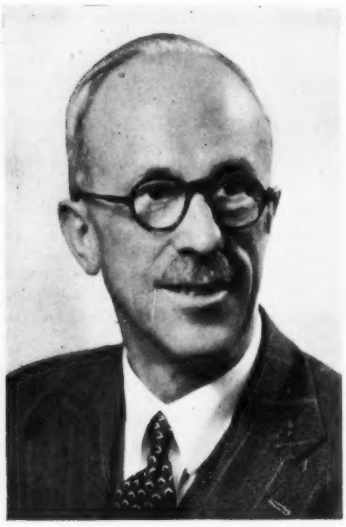
We regret to record the death on July 3, at the age of 84, of Mr. A. W. Steven, J.P., Chairman of Andrew Barclay Sons & Co. Ltd.

Mr. K. Brinsmead, Assistant Civil Engineer (Permanent Way), London Transport Executive, has been appointed Assistant Engineer (Permanent Way), Civil Engineer's Department, Eastern Region, British Railways, Kings Cross.

We regret to record the death on July 2, at the age of 77, of Dr. John Murray Gibbon, D.Lit., F.R.S.C., who retired as General Publicity Agent, Canadian Pacific Railway, in 1945. He was born in Ceylon, and was educated at Aberdeen; Christ Church, Oxford; and Gottingen, and took an art course in Paris. He entered Fleet Street in illustrated journalism, and eventually became Editor of the once-famous weekly, *Black & White*, and a contributor to *The Illustrated London News*. In 1907 he joined the London Office of the Canadian Pacific Railway to supervise its European publicity. During that period of considerable emigration, the work done by Dr. Gibbon was so outstanding that, six years later, he was transferred by Lord Shaughnessy, the then President of the company, to Montreal, to take charge of the world-wide advertising and publicity of the C.P.R. Under Dr. Gibbon's inspiration, the company staged a festival at Quebec, featuring a revival of the arts and handicrafts of the inhabitants, which was so successful that other festivals were held. He was the author of novels, poems, and other works, including "Steel of Empire," the official history of the C.P.R., and founded the Canadian Author's Association. Dr. Gibbon was a Fellow of the Royal Society of Canada. He had the distinction of having a pass in the Rocky Mountains named after him.

The late Dr. J. M. Gibbon

General Publicity Agent, C.P.R., 1913-45



Mr. Benjamin R. Temple

Appointed District Commercial Superintendent, Dundee, Scottish Region

Mr. R. J. Powell

Appointed District Operating Superintendent, Derby, London Midland Region

Mr. G. W. Stewart

Appointed General Assistant to the Chief Regional Officer, Eastern Region

Mr. Benjamin R. Temple, Development Assistant to Commercial Superintendent, Scottish Region, who, as recorded in our June 13 issue, has been appointed District Commercial Superintendent, Dundee, commenced his railway career in 1912 at Bedale (Wensleydale) on the clerical staff of the North Eastern Railway. He served with the King's Royal Rifle Corps for four years during the first world war and on his return occupied the posts of clerk and relief clerk at various stations. In 1926 he went to the Goods Manager's Office at York, specialising in railway rates work, and from 1935 to 1938 he acted as District Canvasser in the Hull district. In 1939 Mr. Temple became Headquarters Inspector at York, in 1943 he took up the post of Chief Clerk in the District Goods & Passenger Manager's Office at Peterborough and in 1944 he was appointed Assistant District Goods & Passenger Manager at Peterborough. Mr. Temple went to Glasgow in 1946 as Head of Development Section, Goods Manager's Office, L.N.E.R., and in 1949 became Head of the Freight Revenue Section of the Scottish Region. In 1950 he was appointed Development Assistant to the Commercial Superintendent.

The Western Region has announced the appointment of Mr. J. R. Hammond, Assistant District Engineer, Newport, as District Engineer, Cardiff.

We regret to record the death on June 26, at the age of 52, of Mr. C. Leslie Fry, a local Director of Thos. W. Ward Limited. He was also Joint Managing Director of Low Moor Best Yorkshire Iron Limited, Joint Assistant Managing Director of the Wolverhampton Steel & Iron Co. (1946) Ltd., and a Director of Birchley Rolling Mills Limited.

Mr. F. J. Lloyd, Principal Executive Assistant in the Office of the Staff Administration Officer, London Transport Executive, has been appointed an officer of the Executive, with the title of Assistant Staff Administration Officer. He will be responsible for the actuarial and pension work of the Staff Administration Office, the central record of staff statistics and the organisation and methods section.

Mr. R. J. Powell, District Operating Superintendent, Barrow, London Midland Region, who, as recorded in our June 27 issue, has been appointed District Operating Superintendent, Derby, began his railway career at Sanquhar on the former Glasgow & South Western Railday in 1912, and was transferred to the Office of the Superintendent of the Line at Glasgow in 1915. After the Grouping, Mr. Powell was transferred to the L.M.S.R. Divisional Headquarters, Glasgow, where, after experience in various appointments, he became successively Passenger Rolling Stock Controller and Assistant Divisional Trains Clerk. He was appointed Assistant to the District Goods & Passenger Manager, Ayr, in 1939, and five years later became Assistant District Goods & Passenger Manager, Perth. Mr. Powell became District Controller, Carlisle, in 1946, and Assistant District Traffic Superintendent at Carlisle, in June, 1948. Six months later Mr. Powell was appointed District Operating Superintendent, Barrow.

Mr. Robert W. White has been elected a Director of the American Locomotive Company.

We regret to record the death on June 30, at the age of 82, of Mr. H. E. Daman, Divisional Engineer, Taunton, G.W.R., 1917-32.

Mr. R. G. Harper, hitherto Research Metallurgist to Fry's Metal Foundries Limited, has been appointed Technical Manager to that company and also to the Eyre Smelting Co. Ltd.

We regret to record the death on June 21, at the age of 66, of Mr. H. Craven, a Director of Cravens Railway Carriage & Wagon Co. Ltd., between 1912-41.

Mr. A. J. Mahon, General Passenger Agent, Winnipeg, Canadian Pacific Railway, has been appointed to Montreal in the same capacity and has been succeeded at Winnipeg by Mr. C. G. Jordan, Assistant General Passenger Agent, Vancouver.

Mr. G. W. Stewart, District Operating Superintendent (Eastern Operating Area), Manchester, Eastern Region, who, as recorded in our July 4 issue, has been appointed General Assistant to the Chief Regional Officer, was educated at George Heriot's School, Edinburgh, and entered the service of the North British Railway at Edinburgh in 1922. In 1929, as a result of a competitive examination, he was made a traffic apprentice and, on completion of the usual period of training, was placed in charge of the Road Transport Section of the Passenger Manager's Office, L.N.E.R., Edinburgh. In this position he was responsible for the co-ordination of road and rail services with the railway associated bus companies in Scotland. Mr. Stewart was appointed to the Staff Section of the Superintendent's Department, Edinburgh, in 1939, and subsequently held the positions of Chief Staff Clerk to the Superintendent, Passenger Manager and Locomotive Running Superintendent, and Staff Assistant to the Divisional General Manager, Scottish Area. He was transferred to the Southern Area in 1942 as Staff & General Assistant to the Superintendent, which appointment also embraced the staff in the Locomotive Running Department of the Area. In 1946, Mr. Stewart was appointed District Superintendent, Lincoln, and in August, 1948, he took up the position of District Operating Superintendent (Eastern Operating Area), Manchester.

Mr. H. L. Walker has been appointed Chairman of the Road Haulage Association Long Distance Panel.

Mr. N. McKelvie Cockshutt, Managing Director of Leyland Motors (South Africa) Limited, arrived at Southampton in s.s. *Pretoria Castle* on July 4 for a business visit to the headquarters' factories of the parent company at Leyland.

Mr. Lloyd D. Morgan, Assistant to Commercial Superintendent (Mineral Rates), London Midland Region, was recently presented with an album containing autographs of more than 130 members of the staff, and a cheque to which they had subscribed, to mark his retirement after 45 years' railway service.

British Transport Commission Statistics (Period No. 5)

Summary of the principal statistics for the four-week period ending May 18

STAFF

—	B.T.C. Head Office	British Railways	London Transport	British Road Services (Road Haulage)	Road Passenger (Provincial & Scottish)	Hotels & Catering	Ships & Marine	Inland Waterways	Docks, Harbours, Wharves	Railway Clearing House	Commercial Advertisement	Legal	Films	Total
Number ...	284	609,119	98,989	76,891	61,448	16,186	6,287	4,852	21,049	613	199	319	41	896,277
Inc. or dec.	−1	+2,218	−198	−771	+522	+104	+240	−9	+93	−10	+1	+2	—	+2,191

BRITISH TRANSPORT COMMISSION TRAFFIC RECEIPTS

—	Four weeks (Period No. 5)		Aggregate for 20 weeks	
	1952	1951	1952	1951
	£000	£000	£000	£000
British Railways—				
Passengers	7,384	8,141	35,401	33,904
Parcels, etc., by passenger train	2,776	2,600	13,210	12,119
Merchandise	8,166	7,733	41,096	36,415
Minerals	3,195	2,814	16,195	13,331
Coal & coke	7,960	7,093	40,224	34,095
Livestock	96	87	539	410
	29,577	28,468	146,665	130,274
British Railways— C. & D. and other road services	916	835	4,436	3,876
Ships and Vessels	747	792	3,216	3,238
London Transport—				
Railways	1,447	1,275	6,679	6,132
Buses & Coaches	3,163	2,656	14,048	12,176
Trams & trolleybuses	795	773	3,642	3,745
	5,405	4,704	24,369	22,053
British Road Services— Freight charges, etc.	6,178	5,961	29,974	28,515
Road Passenger Transport	3,420	3,243	15,643	14,354
Docks, Harbours & Wharves ...	1,249	1,064	5,883	4,813
Inland Waterways	174	153	861	701
Hotels & Catering	1,201	1,235	5,759	5,626
Total	48,867	46,455	236,806	213,450

LONDON TRANSPORT

—	Passenger journeys	Inc. or dec. per cent. over 1951	Car miles	Inc. or dec. per cent. over 1951
	000		000	
Railways...	45,023	− 9·6	17,109	− 4·3
Buses & coaches	227,794	+ 0·1	26,826	+ 4·1
Trams & trolleybuses	63,829	− 16·7	6,347	− 15·7
Total	336,646	− 4·9	50,282	− 1·7

INLAND WATERWAYS

Tonnage of traffic and ton miles

—	Tonnage	Inc. or dec. per cent. over 1951	Ton miles	Inc. or dec. per cent. over 1951
	000		000	
Coal, coke, patent fuel & peat	510	+13·4	7,924	+22·6
Liquids in bulk	172	+ 6·1	4,553	+12·0
General merchandise	307	− 10·4	5,169	− 2·9
Total	989	+ 3·6	17,646	+11·3

BRITISH RAILWAYS

Rolling Stock Position

—	Operating stock	Number under repair	Available operating stock	Serviceable stock in 1951
Locomotives	18,824	3,123	15,701	15,782
Coaching vehicles	57,688	5,688	52,000	52,638
Freight wagons...	1,122,636	78,925	1,043,711	1,048,994

BRITISH RAILWAYS

Passenger Journeys (Month of April, 1951)

Full fares	Monthly returns	Excursions, cheap day, etc.	Other descriptions	Workmen	Season tickets	Total	Inc. or dec. per cent. over 1951
7,773,000	6,379,000	23,827,000	4,125,000	16,797,000	27,936,000	86,837,000	+1·8

BRITISH RAILWAYS

Freight Tonnage Originating and Estimated Ton-Miles (Period No. 5)

—	Minerals	Merchandise	Coal & coke	Livestock	Total	Inc. or dec. per cent. over 1951
	000	000	000	000	000	
Tons originating ...	4,828	4,000	13,495	52	22,375	+4·0
Ton-miles	407,907	550,811*	811,829	—	1,770,547	+1·9

* Includes livestock

BRITISH RAILWAYS (Period No. 5)

—	Total steam coaching train-miles	Total electric coaching train-miles	Total freight train-miles	Freight train-miles per train engine-hour	Net ton-miles per total engine-hour	Locomotive coal consumption	
						Total tons	Lb. per engine-mile
1952	13,648,000	3,753,000	11,121,000	9·0	625	985,000	60·3
1951	14,333,000	3,731,000	10,761,000	8·5	606	1,034,000	62·5

Royal Commission on New Zealand Railways

Summary of submissions to Commission during its recent sittings

The last public sitting of the Royal Commission which is inquiring into the operations of the New Zealand Government Railways closed at Wellington on May 27. More than 100 witnesses had been heard in the cities which the Commission had visited. Sittings were held at Auckland in March, at Dunedin and Christchurch in April, and at Wellington in May.

The procedure adopted by the Commission, which comprises Sir John Allum, Chairman, and Messrs. C. V. Smith and W. O. Gibb, was to request that all submissions be lodged not later than March 21 and, where the Commission desired those making statements to elaborate or explain matters therein, to ask the parties concerned to appear at the public sittings. The Commission's report and recommendations to the Government were expected to be completed in June.

The secretary of the New Zealand Transport Alliance and the New Zealand Carriers' Federation, opposed the present policy of the Department's joint interest in rail and road services and criticised the priority given to departmental interests in the allocation of road transport licences. Private road transport could take over a portion of the loading and co-ordinate the functions of rail and road; all short-haul traffic should be carried by road; and uneconomic branch lines should be closed. Many flag stations were outmoded and could be closed; and preferences for railways and the application of the Transport Act 30-mile restriction should be abolished. He further submitted that railway rates for traffic in competition with other forms of transport should be sufficient to return operating costs plus a profit; and district transport interests should be co-ordinated in discussions in an effort to secure the best possible services from both road and rail.

The evidence given by Railways Department officers related chiefly to the difficulties caused by shortage of staff and equipment, the financial situation, and the rating structure. Direction of manpower to the railways would be of greater economic benefit than extension of road operations. An alternative was to try to obtain suitable staff for the railways from overseas.

Staff Difficulties

Mr. W. E. Worsfold, Staff Superintendent, said that the development of the country had outstripped the available manpower, mainly by the heavy demand on staff for extension of other Government Departments, for road and air services, and for industries and commerce. The annual leave of all operating staff, who were working long hours, was considerably in arrears and caused dissatisfaction, even though the running of trains was curtailed to allow a minimum number of staff to have leave.

In the year 1949 recruitments in the Department exceeded resignations and retirements by 1,100, but in 1951 the position was reversed with an unfavourable balance of 800. Mr. J. B. Main, for the Amalgamated Society of Railway Servants, submitted that this was a result of the refusal of the Government to appreciate the economic position of railwaymen in 1950. This refusal shook the general confidence of their employees and turned away intending recruits. Low wages paid on the railways were provoking men to seek more remunerative employment, and they also hindered recruitment of new workmen.

According to Mr. Worsfold, 50 per cent. of those who left the service went to employment with higher remuneration, and only a small number of the staff occupying railway houses resigned. The principal improvements which he suggested were: more housing to enable staff to be transferred without disruption of home life and to enable additional staff to be stationed where shortages were most acute; intensification of recruitment by immigration, contingent on the provision of accommodation; and priority in provision of labour-saving equipment and methods.

Mr. W. E. Hodges, Commercial Manager, said that the question whether the Department should pay full interest charges was a policy matter. The recent freight rate and fare increases were designed to cover operating costs and contribute about £500,000 to interest on a full year's working. Because the railways had to try to retain their volume of traffic, rail freight increases imposed since 1947 had fallen more heavily on the lower-rated goods. "The remedy," said Mr. Hodges, "seems to lie in the control and delineation of spheres of operation for road and rail transport."

Expenditure on Diesels

Mr. R. F. Black, Chief Mechanical Engineer, proposed that capital expenditure in the next few years should be directed to obtaining shunting and main-line diesel locomotives until most of the traffic in the southern half of the North Island was diesel-hauled, and that major electrification should then be considered, viewing the operating costs of the diesels against the probable future supply, adequacy and costs of hydro-electric power.

The N.Z.R. Road Services Branch submitted that participation of the Railways Department in road transport was an economic necessity arising from the fact that railway control of road services on routes parallel to the railway was the only practical method of restraining wasteful competition between road and rail. Justification for railway operation of services on off-rail routes was mainly that many of them could exist only in association with a major service and responsibility for maintaining them had devolved on the Railways Department. Further, once the major competitive services had come under railway control, a large-scale operating organisation had been brought into being and secondary activity such as school bus services and contract services had become economically justifiable.

Mr. G. L. Laurensen, Commissioner of Transport, as head of a government department concerned in practice primarily with the regulation of road transport, recommended that the Railways Department be relieved of the responsibility of operating all its present road transport services.

Other recommendations made were: review of the 30-miles limit; relieving the Department of the responsibility of operating non-paying branch lines; withdrawal of the Department as much as possible from the short-haul freight market; abolition of the requirement by which consent of the Minister of Railways is necessary to grant transport licences on routes competitive with railway road services; and relieving the Department of the responsibility for running non-paying passenger trains, any necessary services to be provided by private-enterprise road services. Both Mr. Laurensen and Mr. E. A. Gibson, Director of Civil Aviation, were pessimistic about the future of railway passenger services.

Mr. R. T. Smith, Chairman of the Main Highways Board, said that the Board would like to see returned to rail goods which during the last two or three years had been carried by road. The damaging effect of heavy lorries was causing the board concern. This view was supported by the Counties' Association, but representatives of the Road Transport Alliance, Carriers' Federation, and Otago Commercial Transport Association, urged that road transport could give a better service than most branch lines.

North Island Electrification

Mr. F. W. Aickin submitted evidence relating to his proposals to the Government during his term in office as General Manager, Railways Department, for electrification of the North Island Main Trunk Railway. His reports had been carefully investigated over a long period by an investigating accountant appointed by the Secretary to the Treasury and a senior engineer appointed by the Commissioner of Works. The reports had then been the subject of a joint report to the Government by the Secretary to the Treasury and the Commissioner of Works. All reports had been further considered by and reported on by a sub-committee of the Cabinet, and finally the Cabinet considered the project in December, 1950, and approved in principle the recommendations made. These were understood to be for immediate electrification of the Auckland-Frankton Junction section, and approval of electrification of the remainder of the route subject to a detailed examination and report.

As the proposal had been approved to this extent, Mr. Aickin could not understand why it had been shelved, as it appeared. Departmentally, the project might be deemed to be only postponed, but delay was likely to mean that when it was considered again for possible execution it would then be too late because of major commitments for the purchase of other types of traction units, or because sufficient time would not be then available in which to carry out the electrification. If the matter of capital cost was raised, he strongly recommended the Commission to give serious consideration to the proposition, stated in his report, that, as Wellington already had suburban electric railways, and the new Hutt Valley electrification and improvements would cost £6,000,000 or more, Auckland was undoubtedly entitled to suburban electrification. Accordingly, it would be proper to consider the Main Trunk scheme as a Papakura-Paekakariki non-suburban scheme, in which case the gross capital cost for about 370 miles, £6,495,000, was about the same as that for the 20-odd miles of Hutt Valley improvements.

Mr. Aickin requested that his electrification report be produced at a public sitting of the Commission. This was done on May 6, when the report, dated March 25, 1950, was available for publication for the first time.

The Transport Licensing and Co-ordinating Officer of the Railways Department, Mr. J. Walker, said that while the Railways Department maintained differential freight rates it was susceptible to road competition for the higher-rated commodities, and protection of some kind was necessary. Separate spheres of operation for rail and road transport should be defined, and a sphere of operations over certain routes should be defined as the special function of the Department. Within this, all goods should be carried by rail wherever possible, but where the Department believed road transport desirable, it should be carried out on contract by private operators.

The president of the Otago Expansion League, in submitting its case for electrification of southern lines, said that the present high prices and the low potential of coal when converted into heat or power were such that alternatives should be introduced as early as possible. As petrol and oil were imported mostly from dollar countries, large-scale use of them should be avoided, partly because of the expense and partly because it would place the railways at the mercy of overseas shipping, strikes, and war.

Electrification Not Justified

Mr. H. C. Lusty, General Manager, New Zealand Government Railways, made his submission to a private sitting of the Royal Commission. Commenting on the report of his predecessor, Mr. F. W. Aickin, he said that he was unable to advance any sound reasons why main line electrification should be undertaken in the near future. He made special mention of the possible use for some considerable time to come of diesel traction at lower cost than that of electric, and said the capital expenditure for diesel operation and the estimated annual savings with electric traction had been both much overstated.

Mr. Lusty said that the mission of New Zealand Railways officers who went overseas in 1949 did not investigate the desirability of adopting electrification or other forms of traction as an alternative to steam. The members were instructed that the main purpose was to settle the vital technical question of alternating or direct current and were informed that policy on railway electrification had been settled.

The proposals were never investigated by the senior branch controlling officers as had been the procedure for major works previously. Had the usual practice been followed he could say that a recommendation from these officers to proceed with the Main Trunk Line electrification would never have been made. "There is, in my opinion, no necessity to proceed with the work in the immediate future and, as sufficient locomotives will be available to meet all traffic needs for ten years, there is ample time to have electrification and alternative schemes carefully and thoroughly considered before a final decision is made," said Mr. Lusty.

Replacement by one-class railcar services of all provincial passenger trains, leaving the Main Trunk expresses in both islands as the only long-distance passenger trains composed of ordinary stock, was forecast by Mr. Lusty. Thirty-five articulated 88-seat railcars were now on order, and he was recommending to the Government that further orders be placed in the near future.

Major railway development works were needed, but there was a shortage of staff to design and execute work and the building and construction industries had more work than they could deal with expeditiously. Mr. Lusty listed some of the many improvements and additions which were required to yard and line facilities.

The Railways Department, contended Mr. Lusty, should control all transport running parallel to the railways for more than 30 miles. The spheres of operation of the forms of transport needed to be defined. Railway road services, with certain exceptions, could be run at a substantial profit. Over the years from their inception these services had contributed more than £500,000 to the consolidated fund.

Grid Supply for Southern Electric

Rectifiers to replace 46 rotary-converter substations in London suburban area

The Western suburban section of the Southern Region electric lines, which were electrified in 1915, was supplied with power from the railway power station at Durnsford Road, Wimbledon. Having regard largely to the better performance in those days of rotary converters supplied at 25 cycles, this frequency was chosen and current was distributed to manned rotary-converter substations by 11,000-volt cables. This policy was maintained when the Central and Eastern suburban sections were equipped, but in this case power was obtained from 25-cycle plant at Deptford Power Station, now owned by the British Electricity Authority. A total of 46 rotary converter substations, continuously manned, is at present operating on a 25-cycle supply.

With the advent of the mercury arc rectifier, this restriction of frequency no longer applied. The plant at Durnsford Road is nearing the end of its life and it has been decided not to replace it. Similarly, the B.E.A.'s 25-cycle power station equipment needs replacement. After consideration of various alternatives, the Railway Executive in November, 1950, authorised a scheme for the replacement of the existing 25-cycle 11-kV. power supply system by 50-cycle equipment.

Substations and Distribution System

Electric power for the new installation will be drawn from the National Grid at 50 cycles and will feed 72 remotely-controlled substations, including over 300,000 kW. of mercury arc rectifiers, three remotely-controlled switching stations, and 67 remotely-controlled track-paralleling huts. The distribution system coupling the 72 rectifier substations and three switching stations with the Grid will comprise some 300 feeder-miles of new 33,000-volt oil-filled cable. Pilot cables will be installed with the power cables for protection purposes and for remote control from three new control stations of the substations, switching stations, and track paralleling huts.

Four 45-MVA. transformers will be used to step down the voltage of a 66-kV. supply from the British Electricity Authority's Deptford East Power Station to 33 kV. Supply at 33 kV. will also be taken from the B.E.A. at four supply points.

The new installation, for which orders were placed during the past year, will have a considerably increased plant capacity compared with the existing equipment, and this will enable the train service to be augmented, the length of suburban trains to be increased, and the acceleration improved. It will enable ten-car electric trains to be introduced on the congested Eastern Section suburban lines, instead of eight-car trains, as at present, and the first stage which it is hoped to bring into operation in 1954, provides for ten-car trains running on the routes between Charing Cross and Dartford *via* Bexleyheath; and between Charing Cross and Orpington. To accommodate the longer trains, platforms of stations on the routes will be extended and the layout of certain tracks between Charing Cross and London Bridge will be replanned at an additional cost of over £½ million.

Contracts in connection with the power supply conversion scheme have been recorded in our pages during the past year as they have been placed. The principal items involved are recapitulated below:—

High-voltage switchgear—General Electric Co. Ltd.; British Thomson-Houston Co. Ltd.

Rectifier equipment — Hackbridge & Hewittic Electric Co. Ltd.; General Electric Co. Ltd.; English Electric Co. Ltd.

D.C. switchgear — British Thomson-Houston Co. Ltd.; Bertram Thomas Engineers Limited.

High-voltage and pilot cables—Pirelli General Cable Works Limited.

45-MVA. transformers—British Electric Transformer Co. Ltd.; Hackbridge & Hewittic Electric Co. Ltd.

The Last London Tram

Completion of the work of converting the London tramway system to bus operation was marked on Saturday night, July 5, by the formal reception at New Cross Depot of the last tram by Lord Latham, Chairman of the London Transport Executive, accompanied by Mr Edwin Bayliss, Chairman of the London County Council, and the Mayors of the nine London boroughs affected by the final conversion.

The party assembled at Charlton Works at 10.45 p.m., and travelled by special tram (No. 1952) to New Cross Depot, where Lord Latham spoke of the contribution of trams to London transport, and the policy of conversion.

The last tram to run (No. 1951) on Route 40, was due to leave Perrott Street, Woolwich, at 11.57 p.m., and to be received by Lord Latham at New Cross at 12.29 a.m.; actually, public interest in the ceremony was such that it was delayed by about half-an-hour. The last tram was driven by Mr. John Cliff, Deputy Chairman of London Transport, who began his career in Leeds 52 years ago on the Leeds Corporation Tramways. The controls were taken by Alderman F. J. Morris, Mayor of Deptford (a former London Transport tramdriver) while the car passed through his borough. At New Cross, there was a hiatus when the car stalled on a section of dead line, and had to be hauled into the depot for the ceremony. It chanced that

the car which hauled it in was No. 1931, which had inaugurated the Kingsway subway as a tunnel for double-deck cars.

The final tramway withdrawal consisted of 162 trams, replaced by 114 buses. The eight stages of post-war tramway abandonment have resulted in 737 trams being withdrawn and 768 buses introduced.

Trams Served London Well

In the course of his remarks Lord Latham said that trams had served London well in their day. They had brought new and better housing within the reach of thousands. As a former Leader of the L.C.C., he was proud to recall the great part in tram development played by local government, and particularly by the L.C.C., at a time when it had seemed probable to the Edwardians that the technological superiority of electric trams over the infant petrol motorbus would always outweigh the obvious disadvantages of trams in the way of road obstruction. By 1927 the once predominant share of the tram in London road traffic had dropped to almost one-third, and in 1933, with the formation of the London Passenger Transport Board, the great task of replacing the entire London tram system was decided upon.

Conversions Ahead of Schedule

By 1940 most routes north of the Thames had been replaced by trolleybuses, but war brought a halt to the conversion scheme. London Transport decided to resume the work in October, 1950, but adopting the latest oil-engined buses. There were about 102 route miles to be converted and two years were set for the task. In fact, the job had been completed in 21 months—three months ahead of the target—but not without some headaches. Lord Latham paid tribute to all concerned, without distinction of grade or job, and said that they had rendered a great service to London.

The ceremony concluded with the official party, and a very large crowd outside the depot, singing "Auld Lang Syne" and the National Anthem.

Questions in Parliament

Steel Allocation Scheme

Mr. George Strauss (Lambeth, Vauxhall.—Lab.) on June 30 asked the Minister of Supply, how he was proposing to vary the principles on which the steel allocation scheme was being administered.

Mr. Duncan Sandys (Minister of Supply): No changes are proposed in the principles, but increased preference will be given first to firms capable of expanding their exports.

Mr. Strauss: Does that mean that the principles now employed are those employed by the late Government, in that the steel allocation is varied quite materially according to the export performance and prospects of various firms? In other words, there is no change at all.

Mr. Sandys: We are putting even greater emphasis on exports, particularly of goods with a high conversion value in non-sterling currencies.

Lt.-Colonel Marcus Lipton (Bristol—Lab.) on June 30 asked the Minister of Supply, to what extent he controlled and co-ordinated the issue of certificates by other Government departments permitting purchase of steel by local authorities, nationalised industries, and private firms.

Mr. Sandys: Not at all.

Parliamentary Notes

B.T.C. Appointments

Mr. Ernest Davies (Lab.—Enfield East) asked the Minister of Transport in the House of Commons on July 7 for a statement on the appointment of a Chairman, Deputy Chairman, and two full-time Members to the B.T.C., whose present appointments expired on August 31; and on those of the Chairmen of the London Transport, Road Haulage, Road Passenger, Docks & Inland Waterways, and Hotels Executives, as the terms of their appointments ended on September 30.

Mr. Alan Lennox-Boyd replied that after discussions with the Commission he was offering to all those full-time Members mentioned in the question—and also to Members of the Railway Executive—continuance of their service for a further year, though not necessarily in every case in their existing appointments.

Dissolution of Road Passenger Executive

This offer, Mr. Lennox-Boyd added, did not apply to Members of the Road Passenger Executive, which would cease to exist after September 30 of this year. He had seen the Members of the Executive and explained the position to them.

When Mr. Davies asked whether the Members would receive any compensation for termination of office at short notice, the Minister said it was not short notice, because the Transport Minister in the Labour Government had told them that they would not be continued in office. He had powers to add to or diminish the number of executives without any regard to the forthcoming Transport Bill.

Transport Bill

The Minister of Transport presented to the House of Commons on July 8 the Transport Bill, and it was formally read the first time.

The object of the Bill is to require the B.T.C. to dispose of the Road Haulage Executive; to amend the law relating to the carriage of goods by road and "to provide for a levy, for the benefit of the said Commission and for other purposes, on motor vehicles used on roads; to provide for the reorganisation of the railways operated by the said Commission and to amend the law relating to the powers, duties and composition of the said Commission; to repeal certain provisions of the Transport Act, 1947, and to amend other provisions thereof; to amend section six of the Cheap Trains Act, 1883; and for purposes connected with the matters aforesaid."

Staff & Labour Matters

W.R. Shed Maintenance Staff Dispute

Fire droppers and coal men at some Western Region locomotive depots began to "go slow" earlier this week because of dissatisfaction with piecework rates of pay; they complained that recent pay increases were paid only for the normal 8-hr. day, and not for any extra piecework, as was done before nationalisation.

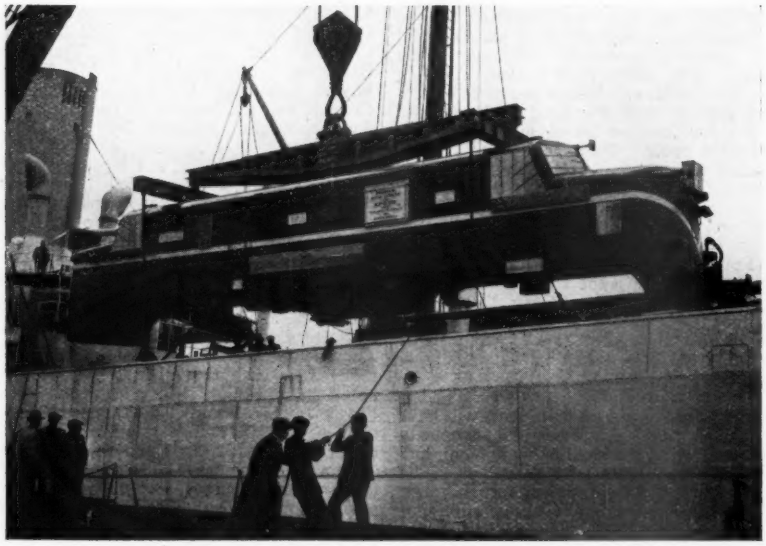
The matter was discussed with the N.U.R.; it is stated that the men were acting against the advice of union leaders.

Railway Wage Claims

Speaking on the railwaymen's claim for a 10 per cent. increase in rates of pay on July 6, on the eve of the N.U.R. annual conference at Scarborough, Mr. J. B. Figgins, Secretary of the Union, referred to the decision to take the claim to the higher stages of the negotiating machinery. He said "we are not unhopeful that the weight of our arguments will lead to a reasonable concession. No independent body could turn down the application in the light of the facts." He said that the efforts of the Chancellor of the Exchequer to get the T.U.C. to agree with the Government policy of a wage freeze would be unavailing because wage and salary rates were dragging behind the increase in the cost of living.

In his report to the N.U.R. annual general meeting, Mr. Figgins said that while costs had risen much above the prewar level, transport charges for the

Electric Locomotives for Spain



Superstructure of one of 60 electric locomotives being built by the English Electric Co. Ltd. and the Vulcan Foundry Limited for the Spanish National Railways (see our May 9 issue) during shipment at Birkenhead

same period had risen to a much lesser degree, and whilst an endeavour must be made to provide an economical and efficient transport service, members of the N.U.R. could not remain quiescent should any attempt be made to subsidise the transport user at the expense of wages and conditions.

On Government transport policy, Mr. Figgins said they had voiced to the Minister of Transport their union's complete rejection of the project to denationalise road haulage, and had repudiated the White Paper on transport.

Munich Station Reconstruction

With its 32 terminal platform roads and 950 departures and arrivals a day, Munich Central Station, flanked by the Starnberger and Holzkirchener Stations, is the largest station in Western Germany. The Munich Region of the German railways sustained heavy damage during the war. Damage to buildings alone called for reconstruction work comparable to the building of a completely new town with a population of 15,000. Because of the lack of labour and essential raw materials, reconstruction had to be concentrated at first on vital track and signalling installations, and the restoration of buildings had to be deferred.

During the first two years or so, all that could be done was to remove the debris and to make the ruins safe. Even this limited programme met with many economic and technical difficulties, but it was possible to provide, among the ruins, some temporary accommodation for essential operating offices, the luggage office and a station restaurant; architectural considerations had to be entirely ignored for the time being.

After the currency reform, labour and materials became available, but unfortunately money had become even shorter, so that the reconstruction had to be further delayed. Shortage of accommodation forced the administration to begin the reconstruction of the north wing of the main line station at Munich in 1948. This work was later continued with the aid of loans, advanced by the lessees of the restaurant and others against future lease payments. A modern station restaurant was thus built in time for the tourist season of 1949.

A further impulse towards the restoration of the station was given by the Oberammergau Festival in 1950 which promised a heavy tourist traffic and caused the Bavarian Government to intervene with the Federal Railways authorities. A credit advanced by the Bavarian State enabled the Federal Railways to proceed in the autumn of 1949 with a major rebuilding scheme. The programme included first the complete reconstruction of the Starnberger Station, which was referred to in our July 20, 1951. issue. In the Central Station itself the following work could be undertaken: Continuation of work on the north wing could be continued; conversion of a passage from that wing to the main ticket hall into a shopping parade; new permanent luggage facilities; and removal of the remnants of the steel structure of the old station roof and their replacement by a new roof which, at present, is confined to a transverse platform 131 ft. wide. All these works had to be carried out during the winter of 1949-50, in time for the Oberammergau season. The shortage of time called for the widespread use of prefabricated elements.

The next stage of reconstruction concerned the south wing, so far not included in the reconstruction programme. Here, nothing but the outer walls had remained, and even they had to be removed when it was found, after debris clearance, that the walls showed considerable cracks. The new four-storey building, erected in 1951, accommodates the railway offices of the American Occupation Authorities and a new railway-owned hotel. The work was on a major scale, requiring the removal of 220,000 cu. ft. of debris, the use of 251 tons of steel and 660,000 bricks, over 90,000 ft. of piping, and 280,000 ft. of wiring.

The hotel, opened in December 1951, has 98 well-equipped single bedrooms and 32 double bedrooms, bar, breakfast room conference and writing rooms, and so on. Many of the bedrooms are equipped with space-saving shower baths instead of bathrooms. Perfect sound insulation keeps the station noise out of the hotel premises. During the first few months of its existence, the railway hotel has been most successful. Another part of the building, adjacent to the main ticket hall, has been reconstructed as a news cinema with 400 seats. The ticket hall will be redesigned for the Munich Traffic & Transport Exhibition, planned for 1953.

Long Welded Rails in Western Germany

Welded rails of considerable length are being laid in increasing numbers on busy main lines in Western Germany. On the electrified Munich - Augsburg main line the rails of both up and down tracks were recently welded to form an uninterrupted length of some 6¼ miles near Munich. While work was in progress on one track, single-line working, to a special schedule covering about 130 trains a day, was maintained on the other. In addition, 23 goods trains and a semi-fast train were diverted, and some suburban trains were discontinued.

In all, 16,000 reinforced concrete sleepers, each weighing some 440 lb., were laid on this section. The work was begun in 1951, and some 3½ miles of track were completed between Olching (11¼ miles from Munich main station and 7¼ miles west of Pasing) and Maisach before the end of the year.

Mechanised Appliances

A further adjoining section of 6¼ miles to near Pasing, 4½ miles from Munich, is being relaid with all-welded track. To accelerate the work new appliances and implements have been developed, including a motorised sleeper-laying machine, a ballast-cleaning machine and a ballast-scraping machine. These, in conjunction with appliances already used, enable 3,280 ft. of track to be dismantled and a similar length of welded track, with reinforced concrete sleepers, to be laid within six hours. The work is carried out in two shifts, and 6,560 ft. of track is laid daily. A film is being made of this method of track-laying.

Inspection of the Olching - Maisach section has confirmed that maintenance of the welded length of rail is almost unnecessary despite the heavy traffic it carries. The long-welded rails have proved absolutely elastic throughout their length and no broken rail has been reported despite high stresses set up in the welded rails by abrupt changes of temperature (common in the area) from an average of 41° F. at night to a reading of over 140° F. on the following midday.

Contracts & Tenders

The Crown Agents for the Colonies have ordered an additional 280 bogie covered goods wagons from the Metropolitan-Cammell Carriage & Wagon Co. Ltd., for the East African Railways & Harbours Administration.

Robert Hyde & Son Limited has recently received the following orders:—

100 Athermos type axleboxes for wagons for the Sudan Government Railways.

240 Athermos type axleboxes for Co-Co electric locomotives from the Vulcan Foundry Limited, for the Spanish Railways.

240 Athermos type axleboxes for Co-Co electric locomotives from the English Electric Co. Ltd., for the Spanish Railways.

A railway construction contract for the National Coal Board has been secured by the Eagre Construction Co. Ltd., Scunthorpe; the preliminary value is approximately £256,000.

The Waggonfabrik Uerdingen A.G. of Uerdingen-Krefeld, has received an order for 100 four-wheel 110 b.h.p. diesel-mechanical railbuses from the German Federal Railway. Eleven railbuses in 1950 and 60 railbuses now in course of delivery preceded this latest order.

Orders have recently been placed with Leyland Motors Limited for diesel engines and running units for use in underfloor-engine buses for the Belgian National Light Railways. The contract for 80 vehicles was divided between Brossel Freres, Bovy & Pipe S.A., Brussels, and Les Ateliers Metallurgiques S.A., Nivelles.

E. Boydell & Co. Ltd. has recently received orders for 35 Muir-Hill loaders through its Brazilian distributors, and for 75 Muir-Hill shunters for the South African Railways from its distributors in that country.

The Board of Trade, Special Register Information Service, has recently reported a call for tenders by the Central Uruguay Railway for the supply of 289 locomotive superheater elements, of various types, to specification. Tenders should reach the Central Uruguay Railway, Ciudad, by 3 p.m. on July 29. A copy of the tender documents and drawings in Spanish is available for inspection until July 14, at the Board of Trade, Commercial Relations & Exports Department, by representatives of United Kingdom manufacturers. After this date it will be available on loan in order of written application. Reference CRE/22838/52 should be quoted.

The United Kingdom Trade Commissioner at Johannesburg has notified the Board of Trade, Commercial Relations & Exports Department, of a call for tenders issued by the South African Railways for the supply of 12 connecting rods for class "GEA" locomotives to drawing C.E. No. A.217/1/15656, without bushes, or any other fittings. Tenders should reach the Chief Stores Superintendent, Johannesburg, by 9 a.m. on August 5.

A copy of the tender documents, without drawings, is available for inspection at the Board of Trade by representatives of United Kingdom manufacturers, until July 19, after which date it will be available on loan in order of written application; reference CRE/23487/52 should be quoted. The drawings may be inspected at the Office of the Chief Stores Superintendent, Johannesburg, and at the Office of any Stores Superintendent.

XUM

Notes and News

Vacancy for Design Engineer.—The North British Locomotive Co. Ltd., require the services of an experienced design engineer to take charge of its diesel traction design office. See Official Notices on page 55.

Sales Representative Required.—A manufacturer of specialised products for the transport industry requires a representative to promote sales and to maintain sales contacts with locomotive and carriage builders, road vehicle operators, shipbuilders, etc., in the North of England and in Scotland. See Official Notices on page 55.

Assistant Chief Mechanical Engineer Required.—An assistant chief mechanical engineer, between 30 and 40 years of age, is required for a mining company in Sierra Leone. See Official Notices on page 55.

Crown Agents for the Colonies.—Applications are invited for the post of assistant engineer (mechanical), between 25 and 35 years of age, required for the London Office of the Crown Agents for the Colonies. See Official Notices on page 55.

Assistant Required in Transport Department, National Farmers' Union.—Applications are invited for the post of assistant in the headquarters' transport department of the National Farmers' Union. See Official Notices on page 55.

Liverpool Overhead Traffics.—During June there were four successive advances in traffics of the Liverpool Overhead Railway, the greatest of which was in the week ended June 15, when there was a £374 advance to £2,911. At June 29, aggregate receipts for the current year amounted to £73,557, as compared with £66,735 for the equivalent period of 1951.

Diesels on the Illinois Central.—At the recent annual meeting of stockholders of the Illinois Central Railroad, Mr. Wayne A. Johnston, President, stated that the system's two diesels worked between Mattoon, an important junction on the main line in Illinois, and Evansville, a rapidly developing town in Indiana which specialises in the manufacture of refrigerators. Reference to these locomotives and their freight train-mileage during 1951 of some 79,000 was made in an editorial article, "A Vivid U.S.A. Railway Report," in our July 4 issue. The resultant savings, said Mr. Johnston, were more than the management expected. He added that diesels were now being considered for freight working west of Chicago and between Meridian and Shreveport, the terminals of a cross-country line in the south.

Scandinavian Travel.—As from July 12 no passports will be needed for Scandinavians travelling between Denmark, Norway, Sweden, and Finland. Foreign exchange for travelling purposes will be practically unrestricted.

Engine Naming Ceremony at Liverpool Street.—The photograph reproduced on this page shows Mr. John Elliot, Chairman of the Railway Executive, and Mr. C. K. Bird, Chief Regional Officer, Eastern Region, holding the plaque presented by Mr. F. Q. den Hollander, General Manager, on behalf of the Netherlands Railways, at the naming ceremony at Liverpool Street, on June 30, of electric locomotive No. 26000 on its return after loan to the Netherlands Railways (see our July 4 issue). Left to right:—

Mr. di Raimondo, General Manager, Italian State Railways; Sir Michael Barrington-Ward, Member, Railway Executive; Messrs. C. K. Bird; F. Q. den Hollander; John Elliot, Chairman, Railway Executive; E. Upmark, General Manager, Swedish State Railways; L. Armand, General Manager, French National Railways; J. Tuja, Secretary, International Union of Railways; F. Delory, General Manager, Belgian National Railways; David Blee, Member, Railway Executive; Dr. Hugo Gschwind, President, Swiss Federal Railways; Dr. Frohne, President, German Federal Railways Committee of Management; and Mr. R. A. Riddles, Member, Railway Executive.

Presentation by Mr. F. Q. den Hollander, General Manager, Netherlands Railways, to Mr. C. K. Bird, Chief Regional Officer, Eastern Region, at engine naming ceremony at Liverpool Street

B.T.H. Engineering Research Fellowships.—The British Thomson-Houston Co. Ltd. has recently instituted the award (annually) of engineering research fellowships. The award is open to Honours graduates who are in their last year of apprenticeship with the company. This year fellowships have been awarded to Messrs. P. H. G. Allen and P. C. McNeill. Mr. Allen's research will be concerned with the subject of heat flow in large transformers and Mr. McNeill will deal with the subject of secondary emission coefficients in magnetrons.

Visit to Stewarts and Lloyds Corby Works.—By invitation of the Directors, members of the technical press were taken on a conducted tour over the Corby Works of Stewarts and Lloyds Limited on Tuesday last. The departments visited included the open hearth plant, consisting of two Wellman Smith Owen 100 ton fixed open hearth furnaces, each capable of producing some 2,000 tons of high grade steel a week, operating on a continuous basis. The Research and Technical Development Department was also visited, where equipment is available for the analysis and testing of iron and steel, and covers such processes as micro etching, thermal analysis, hardness testing and so on. Of particular interest was the inspection of the production of boiler tubes by the electric resistance welding process, producing approximately 380,000 tons of tubes a year, in sizes varying from ¼ in. to 4 in. nominal bore. A technicolour film of the process was also shown.

Time Recovery by "Cornish Riviera" Express.—On June 30, the first day of the summer schedules, this express arrived at Plymouth at 2.41 p.m. 4 min. early, after recovery from checks earlier in the journey. As a result of these checks, Heywood Road Junction (where the Westbury slip portion is detached) was passed 5¾ min. late, in 103¾ min. for 94 miles. An excellent recovery followed, and Exeter, 173·5 miles, was passed in 176 min.—2 min. early. Despite a further check at Newton Abbot, time was again made up, and Plymouth North Road, 225·5 miles, was reached in 251 min. The engine was No. 6008, *King James II*, and the load 425 tons gross to Heywood Road, and 355 tons beyond. No assistance was taken from Newton Abbot over the South Devon line.

See Britain by Train.—A poster drawing attention to the possibilities of railway travel as a means of seeing the country rather than merely getting from place to place, has been produced on behalf of British Railways by the Public Relations & Publicity Department of the London Midland Region. The design shows portions of a railway carriage cut out in the shape of a map of England, Wales and Scotland. Distinctive colouring adds to the effectiveness of a design that tells its story by means of ingenious adaptation of its material.

Tube Investments Limited.—At a meeting of the Board of Tube Investments Limited held in London recently, the following dividends were declared, less income tax at 9s. 6d. in the £: on the 7 per cent. cumulative first preference stock, a dividend at the authorised rate for the seven months ending May 31, 1952; on the 4½ per cent. redeemable cumulative preference stock, a dividend at the authorised rate for the half-year ending May 31, 1952; on the ordinary stock, an interim dividend of 13¼ per cent. actual on account of the year ending July 31, 1952. An ex-

OFFICIAL NOTICES

The engagement of persons answering Situations Vacant advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

ASSISTANT CHIEF MECHANICAL ENGINEER required for Mining Company, Sierra Leone, age 30/40. Must have had theoretical training and sufficient practical experience preferably with some knowledge of steam and diesel railway traction. Annual salary £1,060. Tours 12/18 months, liberal leave on full salary between tours. Free furnished quarters, medical attention, contributory pension scheme. Write giving full details, qualifications, experience, with copies references, stating age, married or single, to Box R.G. 371 at 191, Gresham House, E.C.2.

A SALES REPRESENTATIVE is required for the promotion of sales of specialised products for the transport industry and the maintenance of sales contacts with locomotive builders, carriage builders, road vehicle operators, coach body builders, shipbuilders, etc., in the North of England and in Scotland. Though not essential, an engineering background and the ability to read engineering drawings would be an advantage. The post carries with it superannuation benefits and the representative would be required to reside in and operate from the Leeds district. Applications are invited from individuals having the necessary experience and qualifications and in applying, details of past experience should be given together with age and salary required.—Box 530, *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

THE NORTH BRITISH LOCOMOTIVE CO., LTD., require the services of an experienced Design Engineer to take charge of their Diesel Traction Design Office. Applicants approximately 35 years of age and upwards should have experience in the preparation of complete tenders including supervision of diesel locomotive project design, weight distribution and performance calculations. Good staff conditions prevail, also excellent Superannuation Scheme. Applications should be made to the Company, 110, Flemington Street, Glasgow, N., giving particulars in detail of training and experience.

REQUIRED for the Central Railway of Peru, Railway Stores Assistant (Clerical). Qualifications: Secondary School Education and holding School Leaving Certificate, preferably with some previous commercial experience. Age from 23 to 30 years. Knowledge of Spanish desirable. Single man preferred with experience in a Stores Department of a British Railway or an Engineering concern. Apply to —THE PERUVIAN CORPORATION LTD., 144, Leadenhall Street, London, E.C.3.

CROWN AGENTS FOR THE COLONIES

ASSISTANT ENGINEER (MECHANICAL) required for the London Office. Salary scale £575×£25—£750×£30—£900 a year. The £575 minimum is linked to entry at age 25 and is subject to increase at the rate of one increment for each year above that age up to but not exceeding age 34. Fully qualified officers of at least 27 years of age who have completed at least 2 years' satisfactory service are eligible, under certain conditions, for a special increase in salary of £75. Pay Addition to basic salary payable at the rate of 10% on first £500 and 5% on second £500. Extra Duty allowance of 8⅓% on basic annual salary plus Pay Addition also payable at present. Engagement will be on unestablished terms with a prospect, after satisfactory service, of appointment to the established and pensionable staff in due course, vacancies permitting. QUALIFICATIONS: Candidates between 25 and 35 years of age should have passed the qualifying examination for Associate Membership of the Institution of Mechanical Engineers, or equivalent examination. They should have served an apprenticeship or pupilage in the Locomotive or Rolling Stock Departments of the British Railways, or with a firm of locomotive or rolling stock builders. Subsequent drawing, office experience in the design of steel carriages and wagons and diesel railcars desirable, together with a sound knowledge of modern workshop practice. Duties include preparation of contract specifications, examining and approving drawings, design calculations, and technical correspondence. Apply at once by letter, stating age, full names in block letters, and full particulars of qualifications and experience and mentioning this paper to the CROWN AGENTS FOR THE COLONIES, 4, Millbank, London, S.W.1, quoting on letter M.29209.B. The Crown Agents cannot undertake to acknowledge all applications and will communicate only with applicants selected for further consideration.

N.E.R. HISTORY.—Twenty-Five Years of the North Eastern Railway, 1898-1922. By R. Bell. C.B.E., Assistant General Manager, N.E.R. and L.N.E.R. Companies, 1922-1943. Full cloth. Cr. 8vo. 87 pages. 10s. 6d.—*The Railway Gazette*, 33, Tothill Street, London, S.W.1.

CHIEF BOILER INSPECTOR required by British Railway Company operating in Chile and Bolivia. Only candidates with Railway training and experience should apply by letter to Box 5988, c/o CHARLES BARKER & SONS, LTD., 31, Budge Row, London, E.C.4.

JUNIOR TRAFFIC OFFICIAL with Railway Traffic apprenticeship experience required for the Southern Railway of Peru, age 20/25 years, single, knowledge of Spanish would be an advantage. Apply to the SECRETARY OF THE PERUVIAN CORPORATION LIMITED, 144, Leadenhall Street, London, E.C.3.

NEW ZEALAND RAILWAYS

ENQUIRIES are invited from men with experience in the DESIGN OF RAILWAY POINTS AND CROSSINGS for service in New Zealand. Commencing salary according to qualifications and experience gained in this class of work. Applicants should state present remuneration, giving an indication of what salary would be expected if offered an appointment. Application forms and conditions of appointment, etc., may be obtained on request from—THE HIGH COMMISSIONER FOR NEW ZEALAND, 415, Strand, London, W.C.2., mentioning this paper and quoting reference number A3/36/26. Completed applications to be lodged as soon as possible and in any case not later than August 15, 1952.

REQUIRED WORKS MANAGER for large works in India engaged in steam locomotive and other heavy engineering manufacture. Applicants should have held senior executive positions in large engineering workshops and have had experience in all aspects of works management. Age between 36 and 48. Good pay and prospects for suitable man. Apply in confidence giving details of education, experience with present emoluments and salary required. Write Box No. 5986, c/o CHAS. BARKER & SONS, LTD., 31, Budge Row, London, E.C.4.

NATIONAL FARMERS' UNION invite applications for post of Assistant in Headquarters' Transport Department. Applicants should have experience in Road and Rail Transport; knowledge of transport law an advantage. Post will carry salary not less than £500. Applications giving full particulars, age, educational qualifications and experience should be addressed to General Secretary, NATIONAL FARMERS' UNION, 45, Bedford Square, London, W.C.1, within fourteen days of this advertisement.

REQUIRED for the Southern Railway of Peru. Locomotive, Carriage and Wagon Senior Draughtsman 30/35 years of age. Qualifications: Must have served a full general apprenticeship in an Engineering workshop (preferably Railway) and have had at least five years' drawing office experience with some time in an executive capacity. A knowledge of Spanish an advantage. Future prospects. Apply to the Secretary, PERUVIAN CORPORATION LIMITED, 144, Leadenhall Street, London, E.C.3.

BOUND VOLUMES.—We can arrange for readers' copies to be bound in full cloth at a charge of 25*s.* per volume, post free. Send your copies to the SUBSCRIPTION DEPARTMENT, Tothill Press Limited, 33, Tothill Street, London, S.W.1.

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traordinary meeting held later the same day approved capitalisation of £3,424,302 of the amounts standing to the company's capital and revenue reserves, and the application of this sum in paying up in full 3,424,302 ordinary shares of £1 each to be issued in the proportion of one new share for every £1 in nominal value of ordinary stock held at the close of business on April 22, 1952.

Leyland Motors Limited Agents.—The agency in Cuba for Leyland Motors Limited, which was previously known as Compania General de Ventas y Fomentos, S.A., has changed its title to Compania Comisionista Centro Americano, S.A., and has moved to new offices in Havana at Apartado, 74. The Gutwirth Trading Co. (Indonesia) Ltd., N.V., the company representing Leyland Motors Limited in Java, has also changed its name and address to: Java Motors Import Corporation N.V., Djakarta, Postbox 95, Indonesia.

George Cohen Sons & Co. Ltd.—The directors of George Cohen Sons & Co. Ltd. state that the exceptionally favourable trading conditions of the year ended March 31, 1952, are not expected to continue through the current year. A final ordinary dividend is proposed of 18 per cent., against 15 per cent. a year ago, making the total distribution for the year 26 per cent. (23 per cent.). The combined profits of the group, subject to tax, amounted to £1,825,770, an increase of £957,685 over the figure for a year ago. Taxation requires £1,111,500 (£525,853), with net profit £714,270 (£342,232), of which the parent company's share was £704,019 (£331,983). The dividends on the ordinary capital paid and proposed absorb £81,900 (£73,650) and those on the preference capital £35,438 (£37,125). The general reserves of the parent and subsidiaries are allocated £470,000 (£77,333), with the group carry-forward increased from £199,260 to £586,581.

Scottish Region Station to Close.—On and from Monday, August 4, Glenbuck Station, situated between Inches and Muirkirk Stations on the Lanark-Muirkirk line, will be closed. The area is served by a Central S.M.T. bus service operating between Lanark and Muirkirk. Passenger train parcels and miscellaneous traffic and freight train traffic for Glenbuck will be dealt with at Muirkirk Station, unless otherwise consigned.

Derwent Valley Light Railway Company.—The accounts of the Derwent Valley Light Railway Company for the year ended December 31, 1951, show a tonnage hauled of 82.723 compared with 93,922 in the previous year. There were increases in the following classes of goods traffic: potatoes, 4,230 (4,001); stone, 1,289 (1,051); timber other than pitwood and mining, 1,469 (721); carrots and turnips, 278 (174); inflammable liquids, 15,481 (14,630); and oils, 19,074 (5,834). Gross receipts were £23,939, compared with £19,765, and expenditure was £17,900, against £16,124. The net revenue of £7,706 compares with £9,660. After addition of the balance brought forward of £2,869 and deduction of interest paid on debenture stock, £1,665, a total of £8,910 remained. A dividend of 5 per cent. will be paid on both preferred and ordinary shares, and £2,000 will be placed to general reserve.

Gospel Oak Station, L.M.R.—The St. Pancras and Hampstead Borough Councils have asked British Railways not to change the name of Gospel Oak Station, on the Hampstead Junction line, L.M.R., to Parliament Hill. The change of name was suggested to British Railways, which consulted local authorities.

British Railways Coal, Iron and Steel Carryings. — British Railways carried 211,940 tons of iron and steel from the principal steel works during week ended June 28, which was an increase on the previous week and the corresponding week last year. Coal cleared by rail from deepmined pits and opencast sites for the week ended 6 a.m. on July 7, amounted to 3,076,940 tons, which was also an increase on the corresponding week last year.

Glasgow-Edinburgh Cheap Day Tickets.—Cheap day return tickets were introduced experimentally between Glasgow and Edinburgh, Scottish Region, on July 1. The new fares are 7s. 6d. third class and 11s. 3d. first class and the tickets are issued at Glasgow (Queen Street, and Central) and at Edinburgh (Waverley, Princes

Street, and Haymarket). The cheap day returns are valid by all trains after 9.30 a.m., except the "Queen of Scots" Pullman, 10.50 a.m. from Glasgow Queen Street to Edinburgh and 8.10 p.m. from Edinburgh Waverley to Glasgow.

Special Trains for Reservists.—Three special through trains were run from North Eastern Region stations to Towyn, North Wales, on July 5 for Territorials and "Z" Reservists reporting to camp. The trains ran from West Hartlepool and Leeds City; Leeds Central, Bradford, Halifax, and Crewe; and Leeds City, Dewsbury, Mirfield and Huddersfield.

British Railways Dublin Inquiry Office.—The former L.M.S.R. city booking and inquiry office at 15, Westmoreland Street, Dublin, which has been reconstructed to provide more counter space and also seating for inquirers (see our April 11 issue), came into full operation as a British Railways office on July 7. Its opening makes it possible for ticket sales and inquiries both for London Midland and Western Region travel to be dealt with more speedily and efficiently. The interior of the office has been fitted with an acoustic ceiling, and the heating, ventilation and lighting system have been brought up to modern standards. Decoration of walls and floors is in bright and attractive colours.

Dorada Railway Co. Ltd.—The report of the Dorada Railway Co. Ltd. for the year 1951 states that the balance of revenue was £41,003, which with interest and transfer fees totalled £52,381. With £10,107 debenture interest, £46,199 difference in exchange, and £6,064 provision for depreciation, the net loss for the year was £9,989. The balance brought forward from 1950 and taxation provision no longer required together were £31,090. Of the £21,101 remaining, it is proposed to write down the investment in the subsidiary company by the company's proportion of the loss for 1951 of that subsidiary (£13,626), leaving £7,475 to be carried forward. Passenger and freight traffic in 1951 showed a decline compared with the previous year, caused largely by road and steamer competition.

The Superheater Co. Ltd.—At the recent annual general meeting of the Superheater Co. Ltd., the Chairman, Sir Alexander L. McColl, said he was glad to announce that the turn-over was again a record, and trading profit showed an increase. Due, however, to reduced miscellaneous income and additional taxation, the net profit of £164,412 was some £14,000 less than in the previous year. While he was able to inform the meeting of a record order book, he had to point out that owing to difficulties in the supply of material, especially alloy steel, the turn-over for the current year might not reach last year's figure, despite the high priority classification of their products. Competition abroad, with lower wages and taxation, threatened their export trade, but every effort was being made with the steel allocated to them to meet this competition and maintain their world markets.

Forthcoming Meetings

July 20 (*Sun.*).—British Railways, Southern Region, Lecture & Debating Society, social cruise on the Thames between Windsor and Marlow.

Railway Stock Market

The better trend in stock markets has made further progress, led by another rally in British Funds, which attracted investment demand now that it is being widely assumed that a higher bank rate is unlikely. It is recognised that further measures are likely to help in rebuilding gold and dollar reserves and increasing the value of the £, and that more reductions in imports from non-sterling sources and other developments are probable in due course; though it is possible there will be another meeting of Commonwealth ministers before fresh decisions are made affecting the sterling area as a whole.

Buyers of British Funds are generally prepared to take more than a short view, and they recognise that if, after all, another bank rate increase became necessary, gilt-edged stocks would fall back sharply in price, but looking to the future, it is contended that strengthening gold and dollar reserves and the value of the £ must in the long run also strengthen British Funds as a front rank investment. Therefore, it is being contended that over a period, despite fluctuations from time to time, British Funds may very well appreciate in value, and yields at current prices are not unattractive. The further improvement in gilt-edged stocks extended to most other sections, including leading industrials.

There was also rather more business reported in foreign rails, though main attention outside home securities was in German and Japanese bonds. When there has been final debt settlements in respect of the Japanese bonds later in the year, it would not be surprising if attention in foreign securities switches more to foreign rails. Buying of United of Havana stocks has continued, and in particular, the 5 per cent. debentures have been active and higher at 17½ on the view that they are relatively undervalued and have a break-up value of well over 20 which can hardly be ignored in any capital rearrangement or takeover move. In fact, a capital rearrangement, though admittedly complicated, would, by simplifying matters, probably facilitate a fair and equitable takeover offer should developments of this kind be revived.

Antofagasta preference stock received more attention and has strengthened to 55 xd at the time of going to press; the ordinary stock sold around 12½. More attention has been given to San Paulo 10s. units, which strengthened to 12s. 1½d. Nitrate Rails shares were lower at 19s. 6d. and Taltal 14s. 6d. Brazil Rail bonds have firmed up to 6½. Mexican Central "A" debentures have been around 67. Although less active, awaiting developments in connection with the railroad company's bonds, Manila Railway "A" debentures were 78 and the preference shares 9s. 3d. Leopoldina ordinary and preference have remained firm at 11½ and 28½ respectively. Leopoldina Terminal debentures were 20, and the ordinary shares held their improvement, being quoted at 11½d.

Canadian Pacifics have been active in common with Canadian securities generally, but failed to hold best prices, and are changing hands around $66 at the time of writing. The good yield drew attention to the 4 per cent. preference stock which was quoted at 60, and the 4 per cent. debentures were 77. In other directions, Guayaquil & Quito 5 per cent. debentures marked 27¾, Paraguay Central 6 per cent. debentures 20, and Chilian Northern 5 per cent. debentures 23½ at one time. White Pass Yukon 5 per cent. debentures changed hands around 33¼.

Engineering and kindred shares were generally better with the market trend. Birmid Industries were marked up sharply to 93s. on the share bonus, Guest Keen have been firm at 49s. 9d., and higher dividend hopes helped John Brown (40s. 6d.). T. W. Ward have been firm at 69s. Tube Investments were 51s. 3d., and Metal Industries changed hands around 40s. 3d. Sentiment was helped by growing hopes that there will be no further cuts in steel allocations and that they may be increased in some directions, because it is believed that the engineering industry will have to play an even more important part in export trade. Vickers were 41s. 4½d. and Babcock & Wilcox firmed up to 61s. 6d. George Cohen rose to 18s. 4½d. on the results.

Locomotive building and engineering shares were steady for the most part with Beyer Peacock 27s. 6d., North British Locomotive 14s. 3d., Birmingham Carriage 31s. 3d., but at Glasgow, Hurst Nelson turned easier at 49s. Vulcan Foundry kept at 21s. 3d., Gloucester Wagon 10s. shares 11s., while Charles Roberts 5s. shares held at 18s. 9d. and Wagon Repairs 5s. shares were 11s. 9d.

Traffic Table of Overseas and Foreign Railways

	Railway	Miles open	Week ended	Traffics for week: Total this year	Traffics for week: Inc. or dec. compared with 1949/50	No. of week	Aggregate traffics to date: Total 1950/51	Aggregate traffics to date: Increase or decrease
South & Cen. America	Antofagasta ..	800	27 6.52	£ 151,090	+ £ 22,750	26	£ 4,037,150	+ £ 1,059,830
	Costa Rica ...	281	May, 1952	c1,552,666	+ c986,013	48	c14,398,842	+ c4,220,309
	Dorada	70	May, 1952	32,469	— 2,714	22	166,616	— 10,601
	Inter. Ctl. Amer....	794	Apr., 1952	$1,085,825	+ $214,744	17	$4,754,984	+ $130,795
	Paraguay Cent. ...	274	27.6.52	G515,570	+ G211,180	52	G18,891,496	+ G7,782,599
	Peru Corp. ...	1,050	May, 1952	$8,680,000	+ $856,000	48	$92,012,000	+ $7,791,000
	,, (Bolivian Section)	66	May, 1952	Bs.19,347,000	+ Bs.1,468,000	48	Bs.181,091,000	+ Bs.36,709,000
	Salvador	100	Mar., 1952	c225,000	— c11,000	39	c1,607,000	+ c44,000
	Taltal	122	May, 1952	$3,818,000	+ $1,562,000	48	$25,978,000	+ $7,109,000
Canada	Canadian National†	23,473	May, 1952	19,453,000	+ 1,554,000	22	91,275,000	+ 9,163,000
	Canadian Pacific† ...	17,037	May, 1952	13,042,000	+ 581,000	22	60,769,000	+ 4,122,000
Various	Barsi Light* ...	167	May, 1952	29,565	+ 2,895	4	66,825	— 15,862
	Gold Coast ...	536	May, 1952	327,837	+ 64,197	8	651,248	+ 93,216
	Mid. of W.Australia	277	Apl., 1952	55,294	+ 14,257	44	577,894	+ 179,361
	South Africa ...	13,398	7.6.52	2,006,778	+ 43,306	10	19,270,666	+ 965,494
	Victoria	4,744	Mar., 1952	2,179,266	+ 367,518	39	—	—

* Receipts are calculated at 1s. 6d. to the rupee † Calculated at $3 to £1